GAS JOURNAL

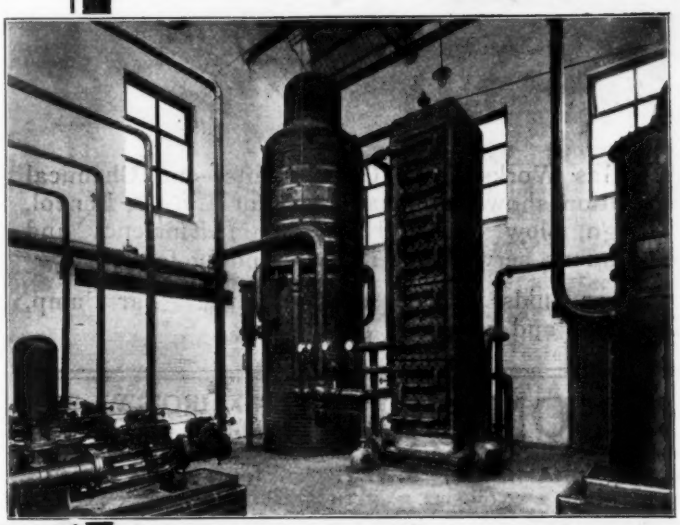
LIGHT . HEAT . POWER . BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

Vol. 191. 82nd Year. LONDON, SEPTEMBER 3, 1930. No. 3511. Price 1s.

BENZOL RECOVERY

is a paying proposition



Benzol Recovery Plant, installed by Simon-Carves, Ltd., capable of recovering 2000 gallons of crude benzol per day.

THE SIMON-CARVES
BENZOL PLANT

will produce once-run benzol (90% at 120° C.) direct from the benzolised oil.

The Gas Light and Coke Company have recently installed SIMON-CARVES BENZOL PLANTS at BROMLEY, SOUTHALL, SHOREDITCH and STRATFORD, and have just ordered a further one for RICHMOND.

Let us quote you for complete plants.

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PATENT RETORTS, LIMITED,
SUPPLIERS OF
COMPLETE GASIFICATION PLANTS, ALSO ROTARY RETORTS FOR TREATING COAL AND SHALE.
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JOSEPH EVANS & SONS,
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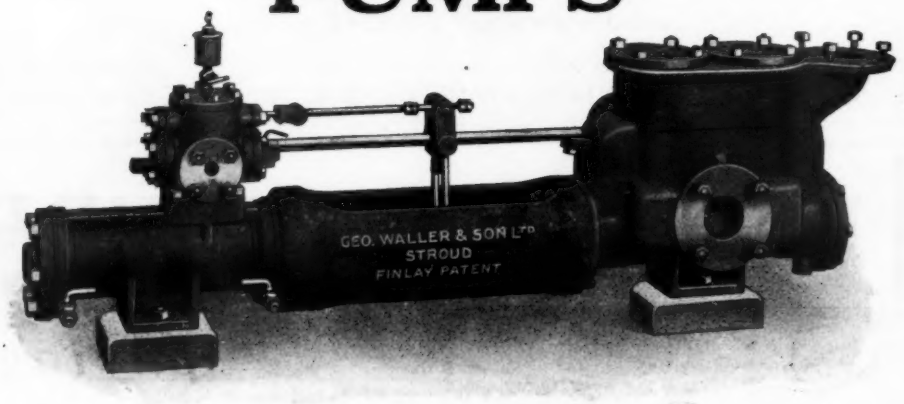
PUMPS



We have specialised in Pumps for Gas Works, Coke Oven Plants, and Chemical Works for over 50 years. The illustration shows an ideal pump for Liquor, Benzol, Oil, Water, etc. Simplicity of Design, Slow Speed, High Steam Efficiency and Reliability under strenuous and continuous service, are its outstanding features.

For dealing with Tar and other viscous fluids, we offer our "Phœnix" Tar Pump, double acting with positive piston valves and reversing gear.

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IMPROVED PATENT COIN

PREPAYMENT GAS-METERS

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These Meters are giving Universal Satisfaction wherever adopted.

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Specify "SUPERLATIVE."

As used on the Tyne, Wearmouth, Booth Ferry, Redheugh, Limpopo, Waihou River, and Bangkok Bridges, also on Transmission Towers throughout the Empire, and by many important Industrial and Public Utility Companies.

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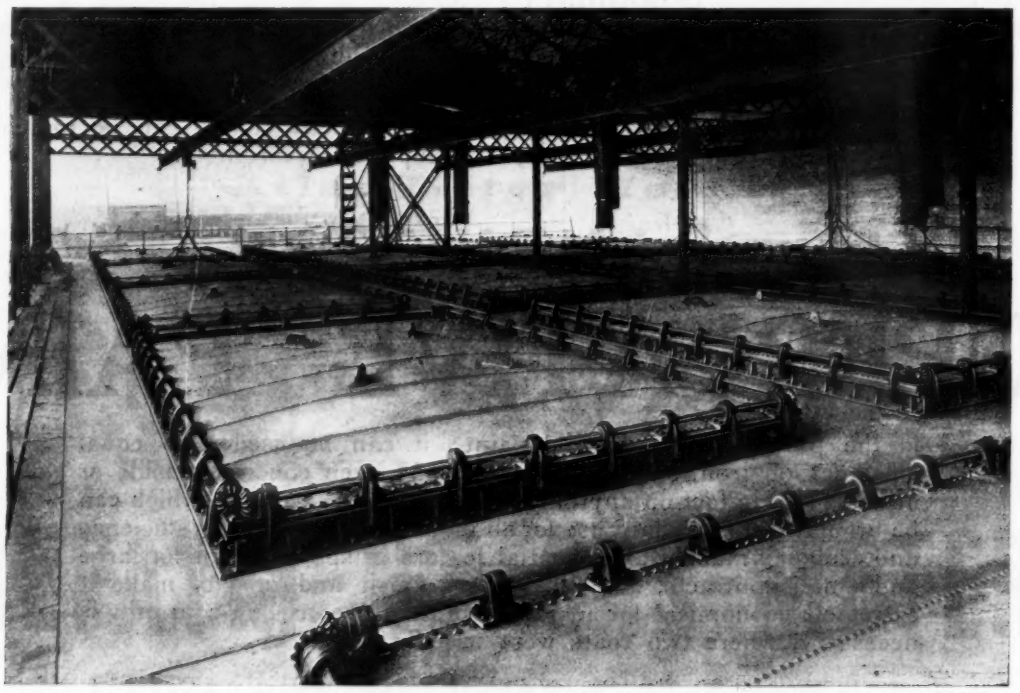

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COMPLETE
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3-LT. WET LEAKAGE METER

Gas Meters of all types.
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Street Lamps and Distance Controllers
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Please write for Catalogue.

Alder & Mackay Ltd
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EDINBURGH : : LONDON
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WHEN YOU SEE RED!

WHEN you see the wrench with the red handle, be certain that it is the genuine Walworth Master Stillson. See the name "Walworth" and be sure it is the real thing. There is little sales talk necessary. Its good name—going back 60 years to Dan Stillson's first wrench—does the selling. Men who know wrenches, know that "genuine" means something with Walworth Master Stillsons.

Stronger and heavier teeth; teeth that keep their bite, job after job; tougher working parts—these are the Stillson's big points.

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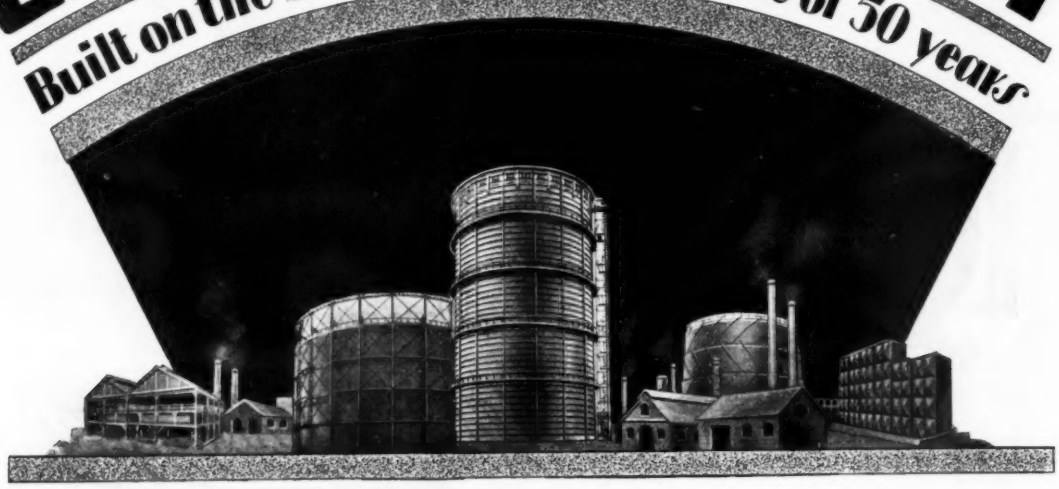
Built on the Concentrated experience of 50 years



ASHMORE, BENSON, PEASE, & Co., LTD.,
PARKFIELD WORKS, STOCKTON-ON-TEES.

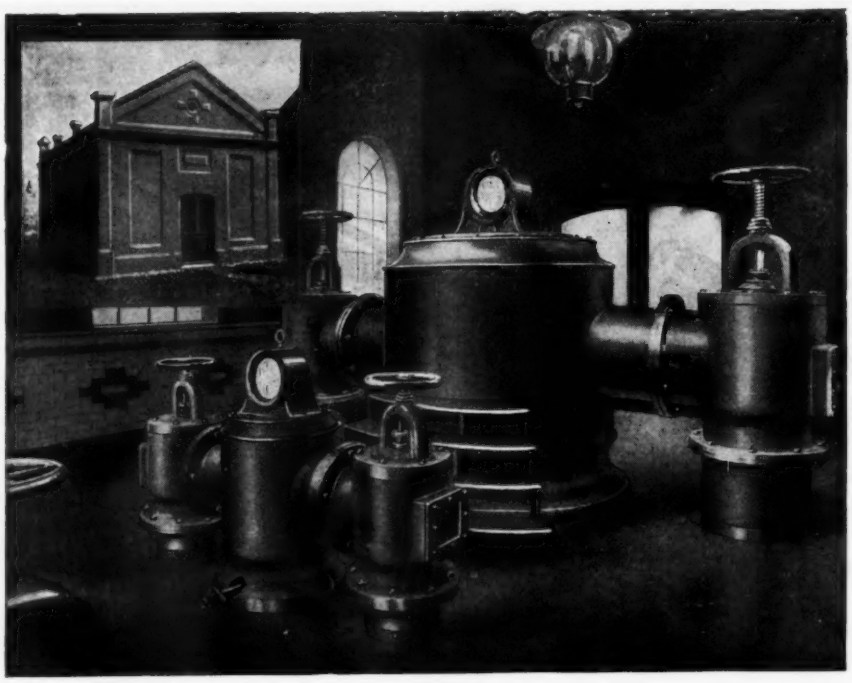


Illustration showing Station Meter House with two Type A Rotary Meters and Valves

THIS INSTALLATION measuring the entire make of purified coal gas, was only ordered after a prolonged test of a Rotary Meter run tandem with a Station Meter of the ordinary Wet Drum Type.

ROTARY METERS

RANK SECOND ONLY TO THE POSITIVE WET DRUM TYPE of STATION METER and are GREATLY SUPERIOR to any INFERENTIAL METER.

STANDARD TYPE FOR CLEAN PURIFIED COAL or WATER GAS.

SPECIAL DESIGN FOR UNPURIFIED GASES.

INEXPENSIVE
ACCURATE
RELIABLE

Send us a note of your requirements and we shall know what to suggest.

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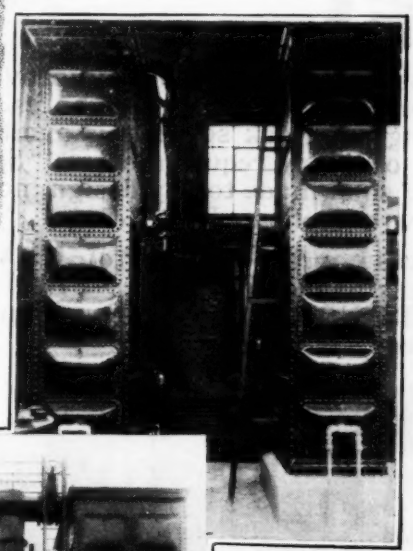
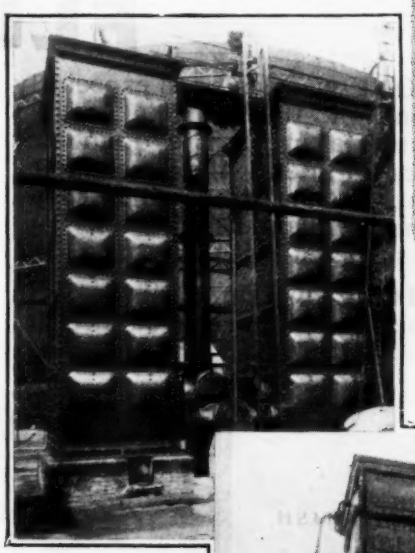
ENSURES EFFICIENT GAS COOLING

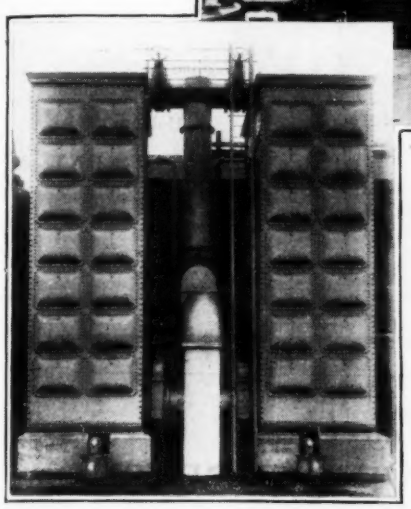


2,000,000 cu. ft. per day

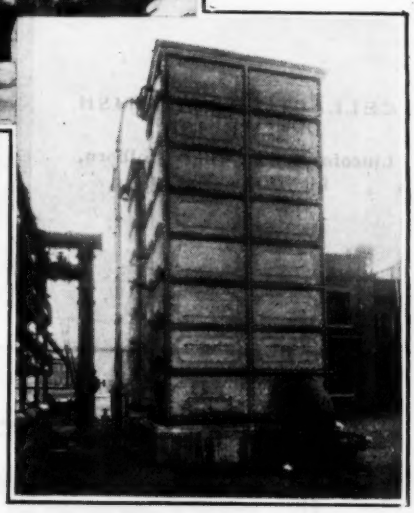


4,000,000 cu. ft. per day

THE WHESSOE CONDENSER



5,000,000 cu. ft. per day



6,000,000 cu. ft. per day

THE SOLUTION OF THE COOLING PROBLEM

Illustrated above are four recent Whessoe Condenser contracts. The design of the Whessoe Condenser has been proved equally efficient for large installations as for small.

Accurate condensation is obtained with low water consumption The straightforward Whessoe design not only gives ease of cleaning, but keeps the initial cost low.

The advantages given by the Whessoe Condenser are lasting. They hold good under all conditions of use.

The Whessoe Company are experts in the design and construction of Gasholders and of gas washing and condensing plant of all types. Write for particulars

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THE WHESSOE FOUNDRY & ENGINEERING COMPANY LTD.

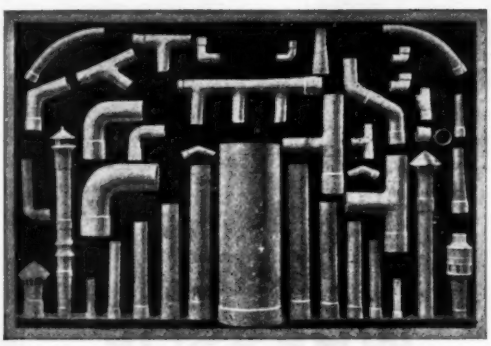
GREAT GAS CONCERNS US:

URASTONE FLUES

URASTONE was designed especially for one of the world's largest gas undertakings. They found the uncertainties of metal flues restricted development. Corrosion, drip, bad draught, and frequent repairs left consumers dissatisfied with gas service.

But URASTONE overcame all that. In addition, the specially prepared internal surface of URASTONE prevented excessive condensation — improving the efficiency of all gas appliances. A full range of stock sections is available for all ordinary requirements. "Specials" are soon made to any design, no matter how complicated.

Please write for list of URASTONE incorrosible COWLS, FLUES, and FITTINGS, or let us know your special needs.



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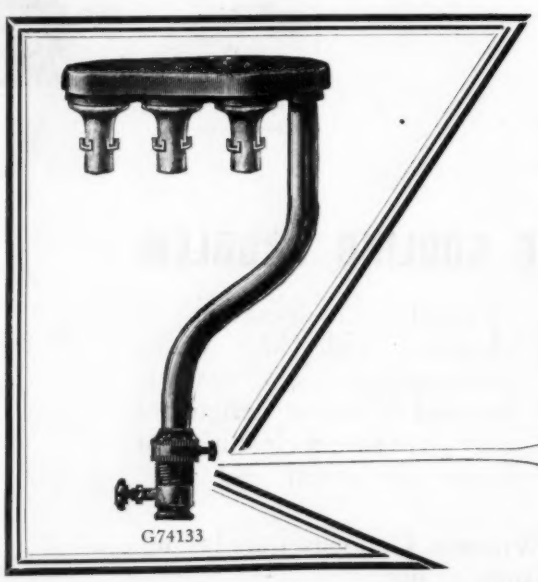

Why Use
EXPENSIVE GADGETS
TO COUNTERACT EFFECTS OF
VIBRATION?
Try Our
VERITAS PATENT
GRADUAL ACTION
GAS ADJUSTER
Absolutely VIBRATION-PROOF
IN CONNECTION WITH OUR
NEW OBLONG CLUSTER
STREET LIGHTING BURNER

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Burner Works: Birmingham.

Sales Equipment for 1930-1

The Illustration shows the "Alhambra Sunbeam." Note the bold lines of the design and the dignity of the "dogs" each surmounted by a polished white metal knob. The reflector fender is constructed of stainless metal and adds greatly to the fire's appearance.

Price Lists sent on Application.

Wilson "New Sunbeam" Gas Fires are specially designed for easy fitting to the various types of coal fire interiors in use at the present time. It is the general opinion that the practical design of the "Sunbeam" meets all requirements most satisfactorily, and as the various new models are distinct improvements over anything Wilsons have yet produced, the Gas Undertaking will find in the "New Sunbeam" a series that is well worth adopting for the coming season.

Wilsons & Mathiesons Ltd.
Carlton Works, Armley, Leeds
(Radiation Ltd. Proprietors)

DRY GASHOLDER

(KLONNE SYSTEM)

IN COURSE OF ERECTION AT

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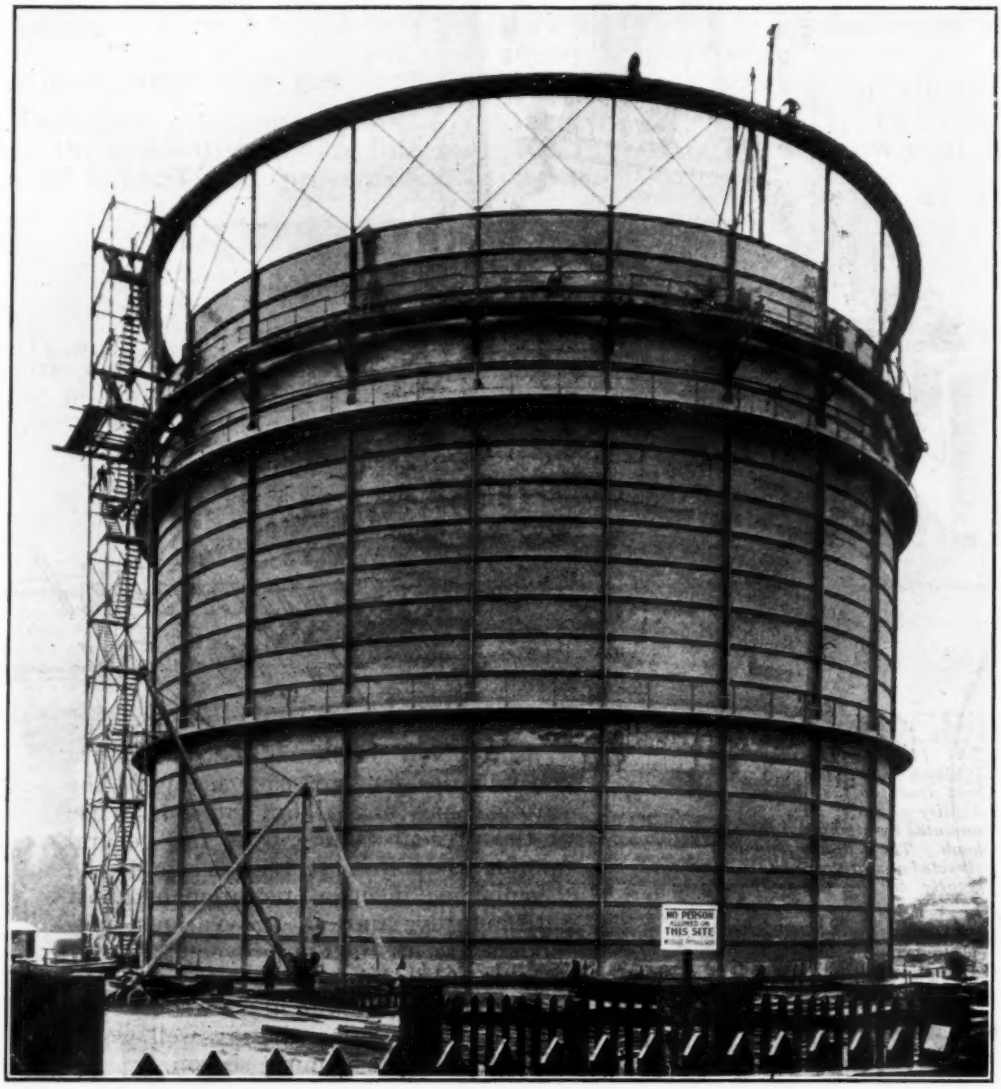
Contractors - ASHMORE, BENSON, PEASE & CO., Ltd.



THIS GASHOLDER WILL HAVE A CAPACITY OF 2,000,000 CUBIC FEET

DIAMETER 126 ft. 0 in. HEIGHT 180 ft. 6 in.

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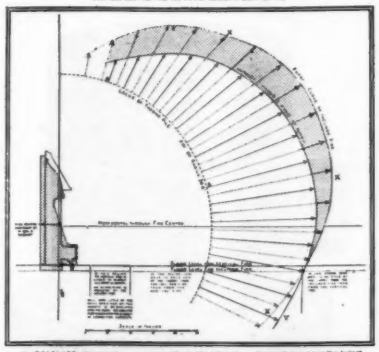
THE HORSELEY BRIDGE & ENGINEERING CO., LTD., Tipton, Staffs.

GAS WORLD

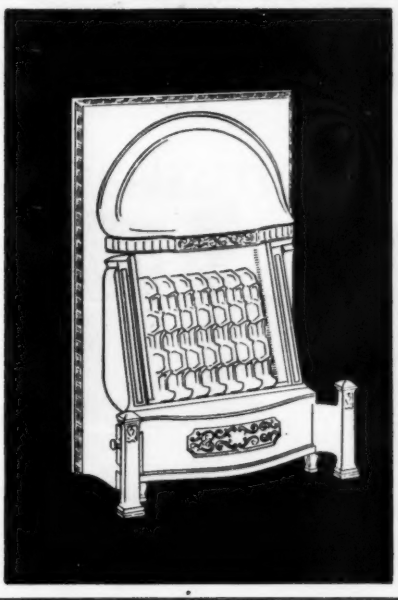
CANNON *New Inclined Gas Fires* GIVE MORE USEFUL HEAT

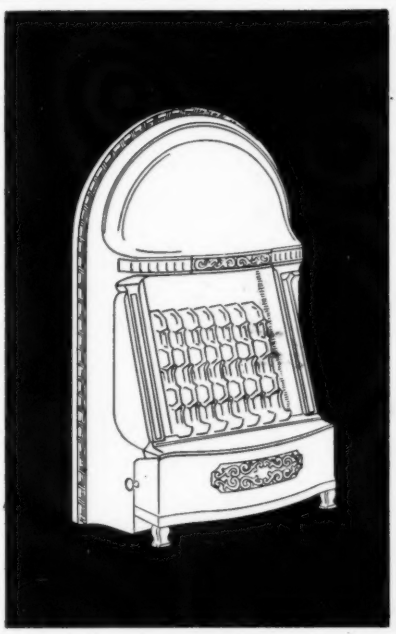
The diagram shows the distribution of radiant energy in the central vertical plane from two gas fires, one inclined, the other vertical. The tests were carried out in our Research Laboratories.



A DELICATE thermopile was mounted so as to traverse the arc AA, at radius 24 inches, and centre the mid point of the double radiant. At every position the arc and the thermopile were moved from one end to the other. The intensity of radiant energy at any point on the arc AA, as shown by the height of the ordinate drawn from that point to a radial direction. The curve, known as XX, shows the distribution of energy from a fire inclined at 45° to the vertical, and the curve YY shows the distribution of energy from a similar vertical gas fire fitted with a radiant reflector. The vertical ordinate AA represents 100 B.Th.U. per hour per square foot of vertical surface located on the arc AA. The shaded area between the two curves XX and YY shows the marked increase in the amount of useful radiant heat obtained from the New Inclined Gas Fire.

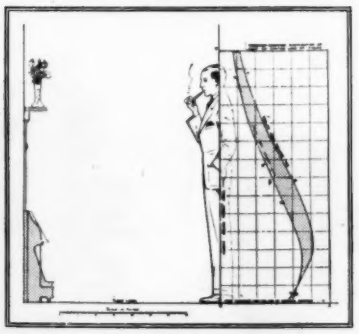
CANNON IRON FOUNDRIES LTD., DEEPFIELDS, Nr. BILSTON, STAFFS. LONDON: 57/58, HOLBORN VIADUCT, E.C.1.





CANNON *New Inclined Gas Fires* GIVE MORE USEFUL HEAT

The curves reproduced below have been obtained by calculation from our laboratory records of the distribution of radiant heat from vertical and vertical fires tested under identical conditions, i.e., the same B.Th.U. for on the same applied pressure.



A MAN is shown standing directly in front of, and at a vertical distance from, a gas fire. 100 units of his body are "warmed" by each fire. The two curves show how the amount of heat received by a square inch of vertical surface located on the centre line, OY varies with the height of that square inch above floor level.

The inner curve BBB shows the distribution due to an old-fashioned vertical fire, and the dotted curve AAA the distribution due to a Cannon New Inclined Fire.

The measurements refer to the central vertical plane of the fire. In the diagram the vertical axis of the square shown is understood to stand in this plane.

The shaded area between the two curves shows the extra useful heat radiated from the New Inclined Fire.

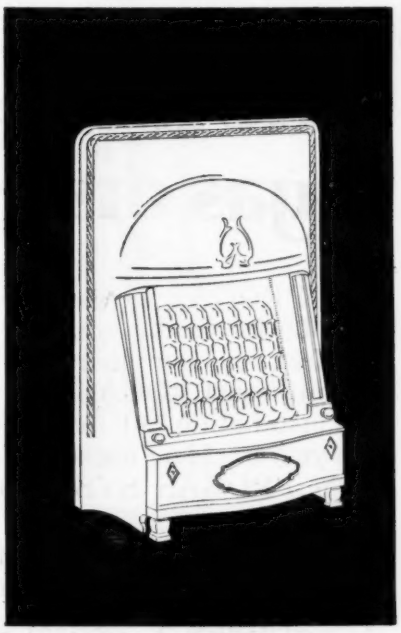
CANNON IRON FOUNDRIES LTD., DEEPFIELDS, Nr. BILSTON, STAFFS. LONDON: 57/58, HOLBORN VIADUCT, E.C.1.

CANNON

New Inclined Gas Fires with

VITAGLO

Radiants



CANNON *New Inclined Gas Fires* GIVE MORE USEFUL HEAT

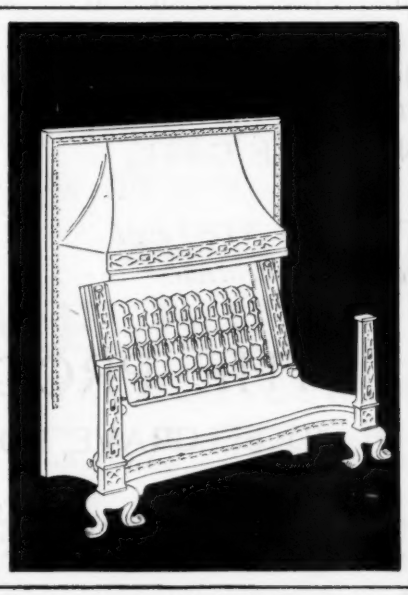
N.B. [illegible]

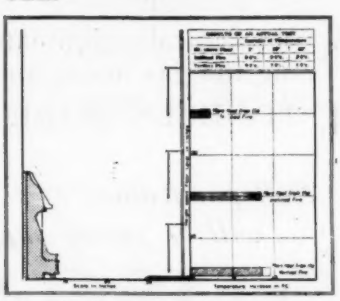
THE two illustrations are from untouched photographs taken in our research laboratories. (For obvious reasons the vertical fire has been made unrecognisable.) The comparative tests were made under identical conditions, the same B.Th.U./hr. on the same applied pressure, the sensitized sheets being prepared with the same reagent and dried simultaneously for the same length of time in the same room. The exposures were made on the same day.

A METHOD has been found to communicate the maximum radiant heat to the room, and to avoid the heating of the chimney throat, and saturated warm air, upstream pollution of polythene [illegible] and allowed to dry slowly for twenty hours. The papers are treated with saturated alkali, previously prepared with the same reagent and dried at normal temperature and allowed to [illegible] for two hours. A constant [illegible] above, at three feet, on the floor in front of the fire and exposed for one hour. Some care is taken to ensure that the [illegible] is not [illegible] by [illegible] [illegible] pipes, whereas the [illegible] perform a useful [illegible].

Wherever scorching occurs, as in the case of the vertical fire, heat is being wasted. Our experiment proves that this heat is not wasted by the New Inclined Fire, but is usefully radiated into the room without scorching the hearth or carpet.

CANNON IRON FOUNDRIES LTD., DEEPFIELDS, Nr. BILSTON, STAFFS. LONDON: 57/58, HOLBORN VIADUCT, E.C.1.





Everybody can read a Thermometer

Make this simple test YOURSELF

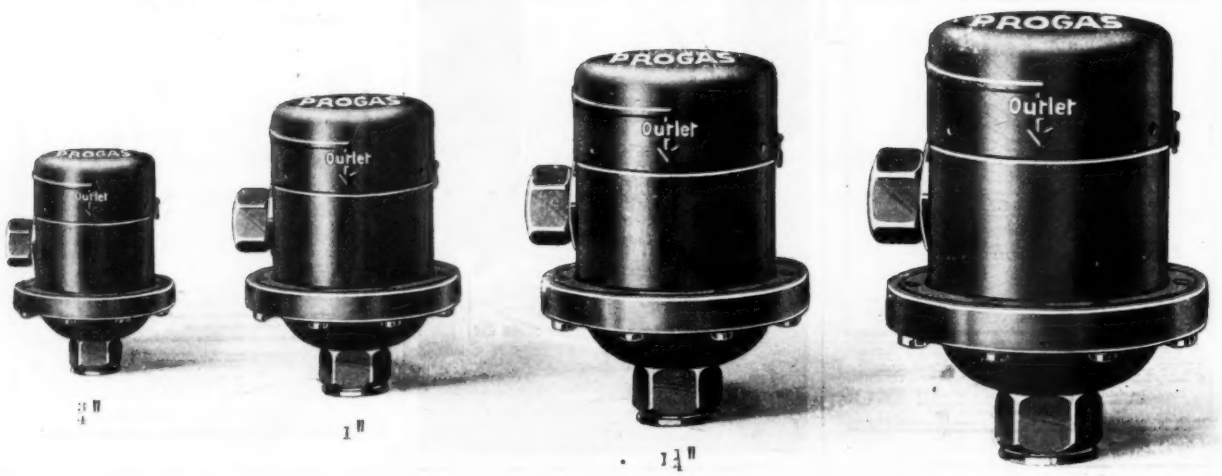
The great advantage of the Inclined Radiant—more useful heat for the same gas consumption—requires no expensive scientific apparatus for its demonstration. Here is a test that a gas engineer can do himself.

CANNON *New Inclined Gas Fires*

CANNON IRON FOUNDRIES, LTD., HEAD OFFICE: DEEPFIELDS, NR. BILSTON, STAFFS.

Copies of laboratory tests illustrated in miniature above free on application to Cannon Iron Foundries, Ltd., Deepfields Nr. Bilston, Staffs.

The PROGAS SYSTEM



The modern way of gas distribution

The PROGAS System marks a new era in gas distribution in this country. Although revolutionary in effect, it is simplicity itself in application. Nearly two million PROGAS Governors have been ordered for installation all over the world during the last two years. Here are a few of the salient advantages of the PROGAS SYSTEM.

1. It raises the capacity of existing house services as much as future demands require.
2. It ensures a constant standardised pressure at the gas appliances.
3. It practically eliminates the heavy cost of enlarging the gas mains and services.
4. IT SELLS MORE AND MORE GAS!

Full particulars of the PROGAS SYSTEM will be gladly supplied on application.

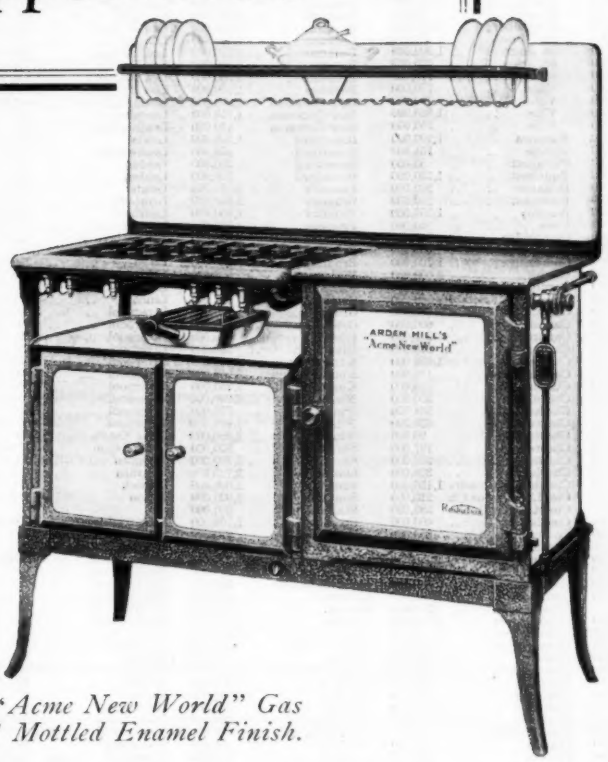
THE PROGAS · CO · LTD

95 BELGRAVE ROAD : VICTORIA : S.W. 1

Telephone: Victoria 6778. Telegrams: "Gasgoverna, Churton, London." Cables: Gasgoverna."

PROGAS

Supreme for Efficiency and Appearance



The R.H.D. 166 "Acme New World" Gas Range in "Rado" Mottled Enamel Finish.

ARDEN HILL'S "ACME NEW WORLD" Gas Range combines efficiency with smart appearance in a way that is making it the popular choice of both Public and Gas Undertakings.

With all the "NEW WORLD" features—Single burner oven, direct bottom-flue-outlet, "Regulo" Automatic oven-heat control, and finished in "RADO" Mottled Enamel—the "ACME NEW WORLD" Gas Range is the last word in cooking efficiency.

Arden Hill's

"ACME NEW WORLD"

'REGULO'-CONTROLLED

GAS RANGES

ARDEN HILL & CO., ACME WORKS, ASTON, BIRMINGHAM *Radiation, Ltd., Proprietors.*

HUMPHREYS & GLASGOW, LTD.

WATER-GAS

	Cu. Ft. Daily
Aarhus	800,000
Abertillery	500,000
Abertillery	100,000
Admiralty:	
British	800,000
British	800,000
British	800,000
British	800,000
British	800,000
French	800,000
French	800,000
Agram	200,000
Airdrie	430,000
Aldershot	1,400,000
Aldershot	1,000,000
Aldershot	1,316,000
Algiers	1,760,000
Alkmaar	400,000
Allenstein	200,000
Alost	700,000
Amersfoort	300,000
Amsterdam	1,000,000
Amsterdam	1,000,000
Amsterdam	2,700,000
Amsterdam	1,350,000
Antwerp	1,500,000
Antwerp	1,000,000
Antwerp	1,500,000
Antwerp	1,900,000
Arundel	215,000
Ascot	423,000
Ashford	250,000
Augsburg	425,000
Aylesbury	150,000
Aylesbury	470,000
Banbury	200,000
Banff	125,000
Barmen	500,000
Barnsley	588,000
Barrow	300,000
Barrow	500,000
Barry	500,000
Barry	720,000
Bath	1,000,000
Bath	1,000,000
Bath	1,300,000
Bath	1,200,000
Bedford	1,000,000
Belfast	1,700,000
Belfast	4,500,000
Belfast	1,250,000
Belfast	1,250,000
Belfast	2,250,000
Benrath	125,000
Berkhampstead	259,000
Berlin:	
Charlottenb'g	2,500,000
Danziger Str.	1,600,000
Neukoelin	650,000
Neukoelin	700,000
Schmargendorf	760,000
Tegel	3,500,000
Tegel	6,350,000
Tegel	245,000
Berne, Switz.	725,000
Bexhill	400,000
Bideford	258,000
Bilston	375,000
Bilston	125,000
Birmingham:	
Adderley St.	675,000
Adderley St.	850,000
Nechells	3,000,000
Nechells	3,000,000
Nechells	3,000,000
Nechells	7,650,000
Swan Village	1,500,000
Windsor St.	3,000,000
Windsor St.	3,000,000
Windsor St.	6,100,000
Bishop's Stortford	200,000
Bishop's Stortford	300,000
Bishop's Stortford	200,000
Bishop's Stortford	300,000
Blackburn	1,190,000
Blantyre	150,000
Blois	125,000
Blois	125,000
Bochum	530,000
Bognor	100,000
Bognor	423,000
Bognor	500,000
Bo'ness	125,000
Boulogne	340,000
Bournemouth	1,000,000
Bournemouth	500,000
Bournemouth	1,500,000
Bournemouth	1,000,000
Bournemouth	500,000
Bournemouth	1,530,000
Bournemouth	2,000,000
Bournemouth	500,000
Bournemouth	2,750,000
Bradford	1,260,000
Bremen	550,000
Bremen	950,000
Bremen	850,000
Brentwood	250,000
Brescia	588,000
Brescia	588,000
Brest	550,000
Bridgwater	200,000
Bridlington	150,000
Bridlington	200,000
Bridlington	550,000
Brieg	100,000
Brierley Hill	250,000
Brierley Hill	425,000
Brighton	1,750,000
Brighton	1,850,000
Brighton	750,000
Brighton	2,750,000
Brighton	3,000,000
Bristol	2,000,000
Bristol	2,500,000
Bristol	825,000
Bristol	825,000
Bromley	1,500,000
Bruges	200,000
Bruges	600,000

Brussels:	Cu. Ft. Daily
Anderlecht	350,000
Anderlecht	350,000
Forest	1,000,000
Forest	1,000,000
Forest	1,000,000
Forest	1,500,000
Forest	88,000
Koekelberg	1,000,000
St. Gilles	1,000,000
St. Josse	1,000,000
St. Josse	600,000
St. Josse	775,000
Ville	750,000
Ville	750,000
Ville	1,500,000
Ville	350,000
Bucarest	1,100,000
Buckie	164,000
Budapest	50,000
Budapest	1,750,000
Budapest	200,000
Budapest	250,000
Burnley	1,350,000
Caen	250,000
Cambridge	500,000
Cambridge	1,000,000
Cambridge	1,700,000
Cardiff	2,000,000
Cardiff	3,000,000
Cardiff	1,950,000
Cardiff	600,000
Carlisle	600,000
Carlsruhe	800,000
Carnarvon	248,000
Charleroi	1,250,000
Châteauroux	125,000
Châteauroux	125,000
Châtelet	500,000
Chester	564,000
Chesterfield	430,000
Chesterfield	90,000
Chesterton	197,000
Chichester	250,000
Chorley	300,000
Cie. des Compteurs	1,150,000
Cie. Lorraine de Ch.	210,000
Cie. Mines de Roche	585,000
Coatbridge	400,000
Commercial, L'n	850,000
Commercial	850,000
Commercial	1,250,000
Commercial	2,000,000
Commercial	800,000
Commercial	2,100,000
Copenhagen	700,000
Copenhagen	2,500,000
Copenhagen	1,750,000
Copenhagen	1,200,000
Courtrai	250,000
Coventry	600,000
Coventry	600,000
Coventry	800,000
Coventry	1,250,000
Coventry	350,000
Cowdenbeath	420,000
Cracow	200,000
Cracow	300,000
Cranleigh	188,000
Crefeld	500,000
Crewe	700,000
Crewe	800,000
Crosfield & Sons	1,500,000
Crosfield & Sons	1,500,000
Crowborough	150,000
Croydon	1,250,000
Croydon	625,000
Croydon	625,000
Croydon	625,000
Croydon	650,000
Croydon	1,125,000
Croydon	150,000
Croydon	3,000,000
Croydon	6,000,000
Deal	250,000
Deal	250,000
Debreczin	100,000
Derby	1,500,000
Derby	2,000,000
Deventer	150,000
Deventer	200,000
Devonport	1,600,000
Devonport	1,100,000
Doncaster	1,350,000
Dorking	150,000
Dorking	300,000
Dorking	130,000
Dover	500,000
Dublin	2,000,000
Dublin	2,000,000
Dublin	650,000
Dudley	600,000
Dundee	1,500,000
Dundee	1,650,000
Dunedin, N.Z.	150,000
Dunedin	275,000
Durham	200,000
Dusseldorf	1,000,000
Eastbourne	1,250,000
Eastbourne	1,550,000
Edinburgh	2,000,000
Eindhoven	1,500,000
Electro-Chimie	650,000
Enschede	282,000
Epping	500,000
Epsom	225,000
Epsom	300,000
Essen	1,400,000
Essen-Borbeck	1,400,000
Exeter	1,100,000
Exeter	1,200,000
Exmouth	376,000
Falmouth	150,000
Falmouth	200,000
Faversham	200,000
Flensburg	300,000
Flensburg	125,000
Fond. del Pignone	164,000
Forst	300,000
Frankenthal	175,000

	Cu. Ft. Daily
Fuel Research Wks.	500,000
Fuel Research Wks.	500,000
Furnes	500,000
Gablonz	140,000
Gas L. & C. Co.:	
Beckton	10,000,000
Beckton	7,000,000
Beckton	3,500,000
Beckton	7,000,000
Beckton	7,000,000
Beckton	5,250,000
Beckton	4,500,000
Beckton	3,000,000
Beckton	1,500,000
Bow Common	1,000,000
Bow Common	1,150,000
Bow Common	150,000
Brentford	1,200,000
Brentford	850,000
Brentford	350,000
Brentford	750,000
Bromley	3,750,000
Bromley	2,250,000
Bromley	1,000,000
Bromley	1,000,000
Bromley	1,000,000
Bromley	1,450,000
Bromley	1,350,000
Fulham	2,500,000
Fulham	1,700,000
Grays	250,000
Grays	400,000
Grays	725,000
Ilford	650,000
Ilford	750,000
Kensal Green	2,250,000
Kensal Green	2,250,000
Kensal Green	2,250,000
Nine Elms	2,750,000
Nine Elms	750,000
Nine Elms	1,870,000
Nine Elms	2,850,000
Shoreditch	900,000
Shoreditch	2,700,000
Shoreditch	2,725,000
Southall	2,000,000
Southall	3,000,000
Staines	600,000
Stratford	1,700,000
Stratford	850,000
Stratford	2,350,000
Stratford	2,350,000
Gelsenkirchen	175,000
Gelsenkirchen	350,000
Geneva	500,000
Geneva	700,000
Geneva	1,270,000
Gennevilliers	10,600,000
Gennevilliers	2,900,000
Girvan	235,000
Glasgow	3,000,000
Glasgow	2,500,000
Glasgow	2,250,000
Glossop	340,000
Gloucester	800,000
Gloucester	1,000,000
Gosport	200,000
Gosport	225,000
Göteborg	300,000
Göteborg	600,000
Graudenz	200,000
Groningen, Holland	500,000
Guest Keen & Piggotts, Ltd.	1,936,000
Guildford	350,000
Guildford	200,000
Guildford	350,000
Guildford	1,100,000
Guildford	150,000
Haarlem	850,000
Hamburg	1,750,000
Hampton Court	500,000
Hampton Court	600,000
Hampton Court	1,100,000
Hanley	800,000
Hanley	800,000
Hartlepool	750,000
Hartlepool	765,000
Hastings	1,250,000
Haywards Heath	470,000
Hebden Bridge	200,000
Heidelberg	200,000
Hereford	525,000
Hertford	197,000
Hertford	244,000
Hessle	150,000
Heywood	500,000
High Wycombe	752,000
Hilversum	850,000
Hinckley	250,000
Holyhead	197,000
Hong Kong	450,000
Hong Kong	450,000
Hornsey	1,000,000
Hornsey	1,000,000
Hornsey	750,000
Hornsey	750,000
Horsham	235,000
Hull	1,500,000
Hull	1,000,000
Hull	1,600,000
Innsbruck	200,000
Ipswich	750,000
Ipswich	1,250,000
Ipswich	600,000
Jersey	564,000
Jersey	564,000
Kampen	350,000
Karlsbad	350,000
Kendal	329,000
Kidsgrove	235,000
Kiel	1,000,000
Kiel	880,000
Kilmarnock	500,000
Kilmarnock	585,000
King's Lynn	197,000
King's Lynn	400,000
Kingston-on-Th.	3,400,000
Kirkintilloch	360,000
Kirkintilloch	827,000

	Cu. Ft. Daily
Kolozvar	100,000
Lancaster	500,000
Langley Mill	500,000
Largs	235,000
Lausanne	250,000
Lausanne	385,000
Lausanne	970,000
Le Mans	420,000
Lea Bridge	350,000
Lea Bridge	350,000
Lea Bridge	400,000
Lea Bridge	1,000,000
Lea Bridge	1,500,000
Lea Bridge	1,530,000
Leamington	600,000
Leamington	525,000
Leatherhead	705,000
Leeds	1,500,000
Leeuwarden	400,000
Leiden	500,000
Leiden	575,000
Leigh	350,000
Lemberg	260,000
Lemberg	500,000
Letchworth	362,000
Letchworth	423,000
Liége	1,000,000
Liége	750,000
Lille	860,000
Lincoln	500,000
Lincoln	893,000
Liverpool	3,500,000
Liverpool	4,500,000
Liverpool	750,000
Liverpool	1,750,000
Liverpool	1,250,000
Liverpool	3,000,000
Liverpool	1,500,000
Liverpool	1,250,000
Liverpool	2,350,000
Liverpool	3,000,000
Long Eaton	430,000
Long Eaton	170,000
Longton	600,000
Louvain	800,000
Lubeck	400,000
Luton	400,000
Maastricht	200,000
Macclesfield	800,000
Magdeburg	1,400,000
Maidenhead	225,000
Maidenhead	225,000
Maidenhead	175,000
Maidenhead	175,000
Maidenhead	200,000
Maidenhead	200,000
Maidstone	500,000
Maidstone	500,000
Malines	500,000
Malines	575,000
Malmo	350,000
Malta	400,000
Manchester	3,500,000
Manchester	3,500,000
Manchester	1,500,000
Mansfield	330,000
Mansfield	493,000
Margate	960,000
Marlborough	150,000
Mayence	700,000
Melbourne	5,000,000
Merthyr Tydfil	300,000
Merthyr Tydfil	200,000
Middlesbrough	1,250,000
Middlesbrough	750,000
Middlesbrough	900,000
M/M. Woolston	9,000,000
Minehead	300,000
Monaco	275,000
Monaco	618,000
Monaco	618,000
Monaco	400,000
Complete Gasification	
Mons	500,000
Montevideo	1,222,000
Morecambe	333,000
Moscow	1,000,000
Munich	1,400,000
Namur	175,000
Narbonne	350,000
Nelson	400,000
Nelson	350,000
Neuss	140,000
Newbury	250,000
Newcastle	2,500,000
Newcastle, N.S.W.	500,000
Newhaven	235,000
Newport Pagnell	188,000
Nice	900,000
Nictheroy	250,000
North Middlesex	200,000
North Middlesex	200,000
North Middlesex	1,000,000
North Middlesex	1,600,000
North Middlesex	800,000
Complete Gasification.	
North Middlesex	900,000
2nd Complete Gasification.	
North Sydney	500,000
North Sydney	500,000
Norwich	1,000,000
Norwich	300,000
Norwich	500,000
Norwich	1,500,000
Nottingham	1,000,000
Nottingham	1,000,000
Nuneaton	125,000
Oberhausen	175,000
Oldbury	500,000
Oldenburg	200,000
Ormskirk	170,000
Ostend	100,000
Ostend	200,000
Zandvoorde	700,000
Oxford	4,500,000
Palermo	963,000

	Cu. Ft. Daily
Palermo	850,000
Paris:	
Clichy	4,000,000
Ivry	2,355,000
Landy	6,000,000
Landy	6,000,000
Landy	5,295,000
La Villette	4,000,000
La Villette	2,000,000
St. Mandé	785,000
Paris-Plage	125,000
Pau	550,000
Pavie	194,000
Pavie	212,000
Pembroke	240,000
Perigueux	350,000
Perth, W.A.	125,000
Perth, W.A.	1,000,000
Petone, N.Z.	200,000
Piggott & Co.	1,500,000
Plymouth	2,000,000
Poitiers	350,000
Pontypool	120,000
Port Elizabeth	400,000
Portsmouth	1,000,000
Portsmouth	2,000,000
Portsmouth	800,000
Portsmouth	2,000,000
Posen	450,000
Posen	700,000
Prague	140,000
Preston	1,400,000
Ramsgate	430,000
Reading	1,000,000
Reading	1,000,000
Reading	600,000
Redditch	500,000
Redhill	275,000
Redhill	300,000
Redhill	1,100,000
Reichenberg	200,000
Reichenberg	200,000
Reval	350,000
Rhymney	175,000
Rhymney	250,000
Riddings	258,000
Ripley	120,000
Rochester	2,200,000
Rochester	2,800,000
Romford	300,000
Romford	350,000
Romford	1,200,000
Rotterdam	850,000
Rotterdam	1,500,000
Rotterdam	750,000
Rotterdam	750,000
Rotterdam	600,000
Rotterdam	2,000,000
Rotterdam	500,000
Royston (Yorks.)	250,000
Rugby	1,000,000
Rugby	450,000
Rushden	425,000
Rushden	517,000
Ryde	500,000
Saffron Walden	235,000
St. Albans	700,000
St. Albans	580,000
St. Andrews	210,000
St. Andrews	409,000
St. Gallen	225,000
St. Gallen	225,000
Ste. Ch.Gr. Paroisse	1,320,000
Sté. Kuhlmann	1,270,000
Sté. Kuhlmann	3,200,000
Sté. Kuhlmann	2,150,000
Sté. Tubes Meuse	545,000
San Paulo	700,000
Scarborough	300,000
Scarborough	200,000
Scarborough	350,000
Scarborough	1,300,000
Scarborough	1,350,000
Seaford	200,000
Shanghai	225,000
Shanghai	225,000
Shanghai	1,600,000
Shanklin	259,000
Shanklin	400,000
Sheerness	200,000
Sheerness	180,000
Sheerness	200,000
Sheerness	220,000
Sheffield	1,530,000
Sheffield	3,000,000
,, Steel Prods.	3,000,000
Shirebrook	500,000
Shrewsbury	300,000
Shrewsbury	170,000
Sidmouth	225,000
Singapore	600,000
Sittingbourne	259,000
Southampton	800,000
Southampton	500,000
Southampton	600,000
Southampton	100,000
Southampton	1,000,000
Southampton	1,450,000
Southend	1,250,000
Southend	900,000
Southend	900,000
Southend	600,000
Southgate	400,000
Southgate	500,000
Southgate	800,000
Southgate	500,000
Southport	750,000
Southport	900,000
Southport	900,000
Southport	450,000
South Shields	650,000
South Shields	1,250,000
Stafford	500,000
Stettin	880,000
Stirling	400,000
Stirling	970,000
Stockholm	1,500,000
Stockholm	1,750,000
Stockport	600,000
Stockport	600,000

	Cu. Ft. Daily
Stockport	400,000
Stockport	400,000
Stockton	500,000
Stockton	250,000
Stourbridge	500,000
Stourbridge	500 000
Sunderland	2,250,000
Sunderland	300,000
Sutton	1,298,000
Sutton	1,623,000
Swanage	300,000
Swansea	750,000
Swansea	1,000,000
Swansea	450,000
Swansea	1,250,000
Swansea	2,000,000
Swindon	300,000
Swindon	450,000
Swindon	400,000
Sydney	1,000,000
Sydney	1,000,000
Sydney	1,000,000
Sydney	1,000 000
Sydney	8,250,000
Taunton	225,000
Taunton	350,000
Tawe Valley	275,000
Teignmouth	200 000
The Hague	1,000,000
The Hague	500,000
The Hague	1,750,000
The Hague	1,500,000
The Hague	775,000
The Hague	1,500,000
The Hague	2,330,000
Tilburg	400,000
Tirlemont	120,000
Tokyo	2,000,000
Torquay	350,000
Torquay	350,000
Torquay	320,000
Tottenham	750,000
Tottenham	750,000
Tottenham	350,000
Tottenham	1,000,000
Tottenham	1,000,000
Tottenham	1,250,000
Tottenham	2,500,000
Tottenham	1,000,000
Tottenham	500,000
Tottenham	1,000,000
Toulouse	1,800,000
ToulouseNatl. Wks.	2,400,000
ToulouseNatl. Wks.	6,200,000
Tournai	700,000
Tours	550,000
Trowbridge	250,000
Trowbridge	150,000
Tunbridge Wells	1,000,000
Tunbridge Wells	1,000,000
Tunis	175,000
Tynemouth	1,100,000
Tynemouth	1,100,000
Ulm	400,000
Union Chim.-Belge	1,977,000
Utrecht	1,000,000
Utrecht	1,000,000
Uxbridge	752,000
Uxbridge	1,000,000
Vancouver	3,800,000
Verviers	1,000,000
Vevey, Switz.	650,000
Victoria, B.C.	500,000
Vienna	3,500,000
Vienna	2,500,000
Walsall	750,000
Walsall	375,000
Waltham	400,000
Waltham	140,000
Walton-on-Thames	970,000
Wandsbek	125,000
Wandsworth	1,800,000
Wandsworth	4,230,000
Wanganui, N.Z.	376,000
Ware	150,000
Ware	282,000
Warwick	125,000
Wasmuel	500,000
Watford	300,000
Watford	350,000
Watford	400,000
Watford	1,250,000
Wath	430,000
Weimar	100,000
Wellingborough	525,000
Wellingborough	525,000
Wellingborough	550,000
Wellington, N.Z.	350,000
Wellington	300,000
West Bromwich	550,000
Westgate	250,000
Weston-Mare	350,000
Weston-Mare	350,000
Weston-Mare	150,000
Weston-Mare	150,000
Weston-Mare	100,000
Wexford	100,000
Weymouth	400,000
Weymouth	100,000
Weymouth	658,000
Whitstable	423,000
Widnes	500,000
Wiesbaden	850,000
Wigston	250,000
Winchester	225,000
Winchester	125,000
Winchester	410,000
Winchester	325,000
Woking	400,000
Wolverhampton	1,500,000
Wolverhampton	1,000,000
Wolverhampton	250,000
Wolverhampton	400,000
Worthing	525,000
Yarmouth	500,000
Yarmouth	125,000
Yeovil	340,000
Zwolle	200,000
Zwolle	200,000
Zwolle	700,000

910 *Sets of Humphreys-Glasgow Plant have been (and are being) installed with a capacity of over* **773,000,000** *cubic ft. of Water-Gas per diem. Including the work of their American Colleagues,* **2004** *Sets have been constructed with a total* **DAILY** *capacity of* **2,101,000,000** *cubic feet.*

HUMGLAS HOUSE, CARLISLE PLACE (Victoria), LONDON, S.W. 1.

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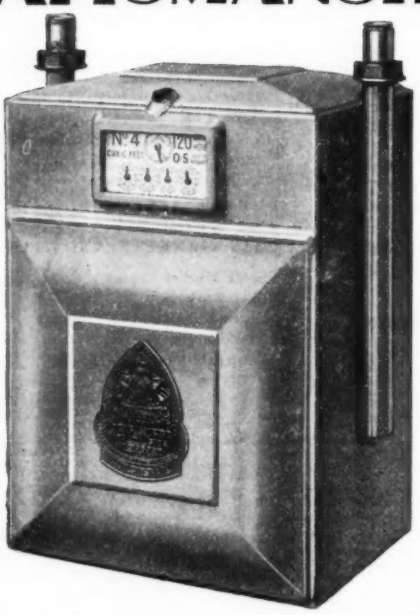

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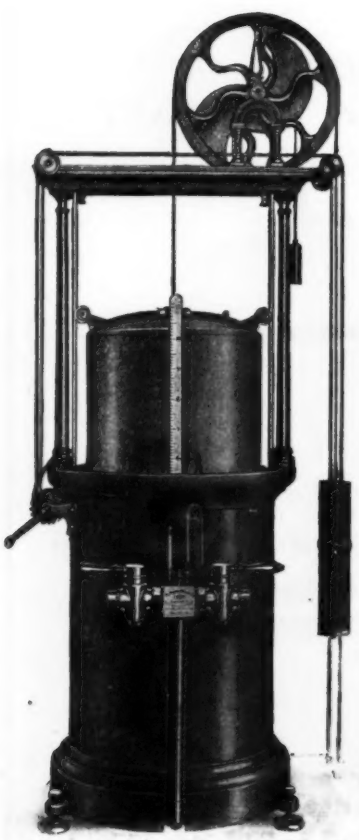

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Vol. 191 82nd Year No. 3511

THE GAS JOURNAL

SEPTEMBER 3, 1930

A Glance at the Contents—

Parent Coal Carbonization.

A brief report of the first ordinary meeting of this Company is published.

In the Early 'Fifties.

Glimpses into the files of the "JOURNAL" show that the gas ignited coke fire is by no means new. It was in operation when Blackpool was a "small bathing town."

Progress at Dungannon.

Mr. D. McIntyre describes how they do things in Dungannon to enable them, in a town of 3800 inhabitants, to record a make of 18 million c.ft. per annum and to have 1000 consumers on their books.

Fine Example of Gas Street Lighting.

We publish a photograph of a portion of the improved street lighting by gas at Smethwick. The illumination is provided by "Rochester" lamps suspended from tramway columns at intervals of from 50 to 60 yards.

Results from Glover-West 50-in. Verticals.

An outline is published of the success of a Glover-West installation of continuous vertical retorts at West Bromwich. The installation comprises two settings, each of which contains eight retorts of the 50-in. "New Model" steaming type. The plant is equipped with four producers, and waste heat from the settings is utilized in a Spencer-Bonecourt boiler. Gas at 450 B.Th.U. is manufactured, and the yield is 84 therms per ton of coal carbonized.

Gas Sales at Carlow.

In a paper before the Irish Association of Gas Managers, Mr. L. G. Young, of Carlow, explains how his Company has met, and continues to meet, competition. Carlow was one of the first towns in the Irish Free State to adopt electricity—even before Dublin. The consumption of gas immediately before the introduction of electricity was 4 million c.ft. per annum, and now it is about 20 millions. Mr. Young deals in turn with the lighting load, the problem of old cookers (an important one where the simple hire of apparatus is practised), and with new methods of charging for gas.

Board of Trade Return.

In our editorial columns we review the Board of Trade Return (Part 1) relating to all authorized gas undertakings in Great Britain for the year 1929. The tale which it has to unfold is one of the most gratifying to our industry for many a year. Not forgetting the severe cold in the early part of 1929, the first striking fact is the increase in gas sales, which on a percentage basis (3·6 p.ct.) may not appear startling, but which represents no less than 10,168 million c.ft., which exceeds the total output of the City of Glasgow. Translated into heat equivalent of electricity, it becomes close upon 300,000 million units of current.

Gas for Baking.

This subject is discussed by R. Kapp. The question of the parity value of various fuels (including electricity) on a competitive basis is considered with due reference to the efficiency obtained in each case. The parity value of gas rises with the efficiency of the oven, and high priced gas can only compare favourably with solid fuel, oil, and electricity with the most efficient type of ovens. This implies good insulation, absence of thermal storage masses, and direct heating. The actual selling price of the gas must be worked out on the basis of its parity value *plus* the various intangible factors involved. The larger the town, the greater looms the aspect of space; and high ground rent, cost of buildings, and wages all combine to place gas in a favourable position. In all cases, however, the undertaking must set itself out to quote the lowest possible special tariff for bakeries. The special tariff must be lower than for central heating.

Ammonia Recovery.

An abstract translation of a recent article by A. Thau, which appeared in "Das Gas- und Wasserfach," is published. The author deals with the economics of ammonia recovery, paying special attention to modern developments. The low price of sulphate of ammonia, he says, has naturally given impetus to the search for a suitable manufacturing process not involving the use of sulphuric acid, the more so since the advances which have been made have given rise to more hopes of ultimate success than appeared likely a few years ago. The fact that these processes have not come into more rapid application in spite of the situation being so favourable to their adoption has been due to hopes, on the one hand, that the processes might be simplified or cheapened, and, on the other hand, that acid prices will not maintain their present level. As against this, however, is the fact that the builders of plants for these processes are prepared to install the plant free of charge and to be reimbursed from the savings accruing from the adoption of the processes. However, this does not apply to small works in which the capital costs of sulphate recovery are relatively too high.

Benzole from Continuous Verticals.

We conclude to-day the contribution by Mr. W. A. Voss, of the Gas Light and Coke Company, on the results of work undertaken in the Company's laboratories to determine the quality and quantity of benzole made in continuously-operated vertical retorts working under normal conditions. The results from two types of continuous vertical settings were gained, and show that both types give benzole of a similar quality. The conclusions drawn from the work are as follows: The benzole in the gas obtained from continuously-operated vertical retorts carbonizing Yorkshire coal is characterized by high unsaturated hydrocarbon and paraffin contents. The unsaturated compounds would probably complicate washing on a large scale, and the acid cost relative to the quantity of useful spirit obtained would be greater than is the case with benzole derived from horizontal retorts. The specific gravity of the benzole approximates to 0·845. This low gravity is due to the large quantity of paraffins, and would make compliance with the existing benzole specification difficult. There is no reason to suppose, however, that the spirit would be inferior as a motor fuel to benzole from horizontal retorts.

EDITORIAL NOTES

Arrows v. Rifles

OUR report of the annual meeting of the Irish Association of Gas Managers is brought to a close this week by publication of the papers by Mr. L. G. Young, of Carlow, and Mr. D. McIntyre, of Dungannon, together with the discussion to which they gave rise. Both contributions are commendably brief, and thoroughly justified themselves in the discussion they evoked; they allowed other members of the Association to express their views, which, after all, is the *raison d'être* of all such meetings. Mr. Young says that the career of the Carlow Gas Company has consisted of a series of "ups and downs;" but we find it hard to follow his line of thought when he suggests that the "downs" have predominated, for his paper points to the reverse. Perhaps, luckily, he is a bit of a visionary as well as a bit of a practical man; and perhaps, unluckily, his dreams have not been translated entirely into fact. We are, however, very glad that he is a bit of a dreamer; we need hosts of dreams of this type—people who can see through a cloud, thereby transforming what to many appears a permanent gloom into what it really is, a temporary obstacle which can be surmounted. Forgetting English millions and American billions, let us for a moment direct our attention to a particular example—Carlow—of the truth that gas and electricity can live together and progress together. That small town was the first to adopt electricity in the Irish Free State; since the introduction of what is popularly considered to be the all-conquering, invisible, magic power, the sales of gas in Carlow have multiplied five times. This is a fact to remember, for the Carlow gas undertaking is a very small one indeed, and it has had to fight a lonely, albeit quite successful, battle. And this battle business. Far too many of us imagine that the two sides—gas and electricity—are unfairly armed; that, whereas we are fighting with bows and arrows, the electricians are armed with the latest pattern of rifle. There is absolutely no justification for this idea; it is entirely our own fault if our weapons are not equally effective—in other words, if we are not equally up-to-date. Gas is not any more old-fashioned than electricity, or, at any rate, it need not be; and the "battle" is not one "to the death." Electricity will not oust gas any more than gas will oust electricity. The battle evolves itself into a fight in a shifting battleground determined by circumstance. The only result can be a shifting of the trenches, a different orientation of vantage points, and, peculiarly enough, an ever-increasing strength on either side.

Carlow Tackles Low

SOME may think that we are becoming a trifle "high-falutin," so we hasten to bedeck ourselves with the brass tacks of the gas-coster; in other words, we return to Carlow and examine the reasons for this five-fold multiplication of gas sales in a period of intense electrical competition. On the introduction of electric current, the Carlow Gas Company reduced their charges for the cooking and heating load. This fact, of course, is significant and is open to the criticism that the new charges could have been offered in palmier, more monopolistic, days. We are here, however, not to blame Cæsar, but to praise him; since competition arrived, Carlow have done remarkably well. Particularly interesting is their attitude towards the lighting load. They emphasize the heating value of gas lighting (we ought to boost this good quality at every possible opportunity); they give "free" maintenance of burners; they forego profit on the fittings themselves; and they offer "trials without obligation." Regarding the outcome of these trials, we cannot do better than quote Mr. Young: "No fittings have been returned to us where we have adopted this arrangement." Carlow were among the first undertakings in Ireland to adopt prepayment meters and free installations, which included a cooker and two lights—a service which has since been modified to include any number of lighting points—they accept payment for apparatus on the instalment system, charging cost price only; and they advertise. We have really no need to cite further reasons for the progress of gas, together with electricity, in Carlow.

There is, however, one other question raised by Mr. Young—and which is one of the most important of current problems, if not the most important—which ought to be emphasized; we refer to his brief survey of methods of charge. This divides itself into two distinct problems: We have to determine a charge which will not detract from one of our main advantages over electricity, and at the same time this charge must be one which returns a reasonable yield on the capital we employ and which is equitable to all consumers, big and small. In the vast majority of small undertakings, says Mr. Young, double the quantity of gas could be manufactured with the existing staffs, and other net charges would remain more or less stationary. We would point out also that in the vast majority of these undertakings a small number of consumers are subsidizing the rest. In the "JOURNAL" last week two such cases (one in Germany and the other in America, both, however, comparable with the general condition of affairs in Great Britain and Ireland) were cited. In the German district, there are 3406 domestic consumers; and a survey showed that no fewer than 703 dwellings took on an average only one farthing's worth of gas a day. In the area in America—a district which serves 70,258 consumers—it was determined that, to meet all costs, a monthly gas usage of 4054 c.ft. per consumer was necessary. Results of the survey showed, however, that 81·6 p.ct. of all the consumers burned less than the requisite quantity each month; in other words 18·4 p.ct. of the consumers were not only paying their own costs, but were making up the losses occasioned by the vast majority. Further examination demonstrated that the group of 81·6 p.ct. of the consumers used only 43·4 p.ct. of the total gas sold. It is obvious enough, then, that new methods of charge must be brought into operation; and in order that these methods may be successful, two cardinal points ought to be borne in mind. Fix the quota with discrimination; let the reduction in price of gas consumed above this quota be really substantial, to serve as a pronounced stimulus to increased gas usage. This idea is expressed by Mr. Young; and it is the right idea. When we have such a system of charging in general operation, efficient salesmanship will do the rest. And in regard to this matter of charging, we call attention once again to the fact mentioned by Mr. F. J. Fottrell at the meeting of the Irish Association—that there exist in Ireland to-day many non-statutory concerns which are possessed of the power to introduce any tariffs which they believe are fair. We look forward to some pioneer work on the part of these undertakings, to secure from every consumer something like a reasonable return on the capital costs he imposes on the suppliers of gas, and to prepare the way for those other concerns who are not immediately in a position to act.

Quota Hunting at Dungannon

THE Manager at Dungannon, Mr. McIntyre, is certainly doing good work about this quota business. He has a thousand consumers on his books, out of 3800 inhabitants, and he is a prepayment enthusiast. As far back as 1904 the Dungannon Gas Company were supplying free installations of three lighting brackets with each prepayment meter. The yearly consumption at that time averaged 3600 c.ft. per meter, compared with 15,300 c.ft. per ordinary meter. Something had to be done about this low consumption, and the method was adopted of supplying to every slot consumer a boiling ring free of charge. Then, the hiring of cookers at low rates was established, and the average yearly consumption per prepayment meter has increased to 10,700 c.ft., and that of the ordinary

consumer to practically 20,000 c.ft. We do not know what the relationship is between these consumptions and the necessary quota to make a consumer self-supporting, but the figures are well worth recording as an indication of what can be achieved by the very small gas undertaking by acting upon the "service" principle and offering to their present consumers all possible facilities to increase their gas usage, and to potential consumers an incentive to follow a good example. The service at Dungannon is very complete for an undertaking of its size. For several years now the Company have supplied their consumers with the services of fitters, free of charge, for repairing leaks, clearing burners, and keeping gasfittings up-to-date. And, says Mr. McIntyre, "we hope to do more in the future, such as supplying new burners of the best type where they are required, free of charge." He is also considering the sending of a fitter periodically to inspect consumers' appliances. This is excellent. There is another point in Mr. McIntyre's paper which impresses us, and that is his determination to give his consumers a gas of unvarying calorific value. This he does by supplying a mixture of producer gas and coal gas, the former being taken from a relief holder into the foul main in the quantities requisite to ensure that the calorific value of the mixed gas does not vary from 500 B.Th.U. In the retort house there is an indicating calorimeter which receives its gas supply from the inlet to the holder into which the mixed gas is travelling. There is also a calorimeter of the same type in the governor house connected to the main leading to the town. The one calorimeter is therefore a check on the other. When the stokers observe any variation of quality showing on the retort house calorimeter they modify the producer gas supply, and are thus able to keep a level quality of gas.

As to unaccounted-for gas, we cannot follow Mr. Young's assertion that increased sales reduce the percentage quantity of leakage to any marked extent. A point of great interest was raised by Mr. W. H. Roberts, of Donaghadee, who has been working the two-part system of gas charging for two or three years with success. The slot meter, he suggested, is one of the difficulties of the two-part system; and he has asked a number of meter manufacturers if they can provide a meter which can be turned to zero when necessary. After the consumer has paid for a given quantity of gas, the meter might then be automatically switched over into a sort of second gear, and supply gas at (say) half the price. At Donaghadee the first 14,000 c.ft. is supplied at 6s. 8d., and the remainder at 3s. 4d. per 1000 c.ft. till the end of the year. Whatever the merits of Mr. Roberts' suggestion, he is to be heartily congratulated on the fact that he reduces the price of gas substantially after a comparatively small consumption. He is acting on the right lines.

Let us Compare

With the sun streaming on every gasholder in the country, we turn to what appears to be the stodgiest of statistical tables, but which we find—as we have found in previous years—to be really most exciting. The table of figures is the Board of Trade Return (Part 1) relating to all authorized gas undertakings in Great Britain for the year 1929, and the tale which it has to unfold is one of the most gratifying to the gas industry for many a year. Not forgetting the severe cold in the early part of 1929, the first striking fact is the increase in gas sales, which on a percentage basis (3·6 p.ct.) may not appear startling, but which represents no less than 10,168 million c.ft., which exceeds the total output of the City of Glasgow. Translated into heat equivalent of electricity, it becomes close upon 300,000 million units of current—a sufficiently imposing figure to impress the lay mind that our industry is very much alive.

This increase in gas sales of 3·6 p.ct. compares with one of 0·8 p.ct. in 1928 and 1·3 p.ct. in 1926, and it is the more remarkable in that the quantity of gas made was only 2·2 p.ct. in excess of the quantity manufactured in 1928. This happy tendency has, of course, manifested itself for the past few years, but not until now in such marked fashion. Further satisfaction will be drawn from the fact that, though the number of consumers increased by practically a quarter-of-a-million, this huge increase is only 2·6 p.ct. greater than in 1928. In other words, the sales per consumer have grown, which is one of the best possible indications of the success of the gas industry, and demonstrates adequately enough that gas is becoming more and more popular as a labour-saving and hygienic fuel. It is now used by 9,137,581 consumers in Great Britain. For the first time in history we have topped the nine-million mark. As to the number of undertakings to which the return relates, these have decreased by 3—from 774 to 771—due to the absorption of four concerns (Crowborough, Dorking, Earl Shilton, and Waltham and Cheshunt) and the addition of the Wateringbury Gas Company, Ltd.

Turning to the sub-divisions of the table, and bearing in mind the years 1926-28, it is seen that the main mileage shows a more or less constant increase—about 1400 miles. Though this is by no means an inconsiderable figure, and is about double what it was in 1920, it is not abnormal in view of present methods of building, and can give rise to no undue anxiety. What must give rise to the liveliest satisfaction, however, is the splendid increase in the sales of gas for public lighting. The year 1928 held the previous record, but in 1929 approximately a further 300 million c.ft. was sold for this purpose, bringing the total to 10,790 millions. Here is more propaganda material, and it should serve as added incentive to those undertakings who are tackling the street lighting load from a scientific basis.

Perhaps the most significant conclusion to be drawn from the return is the remarkable growth not only in the number of prepayment consumers, but in the amount of gas they are now consuming. Nearly 200,000 prepayment consumers were added to the books in 1929, and the increase in consumption (4103 million c.ft.) brought the total to 106,339 millions, compared with 175,468 millions used by ordinary consumers. There are now over 5 million prepayment consumers (the actual figure is 5,164,656), against under 4 million ordinary consumers (3,972,925). This affords sufficient proof of the desirability of giving the fullest facilities, by way of hire of appliances, free fixing, and so on, to the small consumer. And a comparison between the figures relating to the number of ordinary consumers and their average consumption demonstrates that "service" is a fine business proposition.

We give here the following comparative statistics relating to raw materials and bye-products: The coal carbonized was more than in 1928 by 325,000 tons; 30,000 tons less of coke and 1,960,000 gallons more of oil were used in the manufacture of water gas; the quantity of coke and breeze made in 1929 was more than in 1928 by 233,000 tons; the quantity of tar made was more by 4,482,000 gallons, but 266 tons less of sulphate of ammonia were produced. Finally, the quantity of coke oven gas purchased amounted to 10,948 million c.ft. Particulars relating to this will be found in later columns of our issue to-day.

Gas on the Poultry Farm.

When referring recently to the hatching of chicks on a system which is entirely electrical, we remarked that this is a use to which, as the "Journal" volumes testify, gas has been put for many years past. One installation which comes to mind is at the Black Lake Poultry Farm, Egham. This was described in detail, and illustrated, in the "Journal" for March 2, 1921; and ever since that time it has met successfully the first requirement in connection with poultry farming—absolute reliability of temperature regulation. The installation is a Potterton one, and it superseded a coke boiler which, while efficient in other respects, upon the point of regulation of the temperature presented a serious difficulty. In the number of the "Journal" quoted above, reference was made to the high state of excellence in the art of chicken raising which had

been attained on this model farm. Here is a use for gas which should be kept in mind.

An Aid to Milk Production.

On the farm generally, gas has many applications, though necessarily the situations of these farms must be such that they can be reached without too great a capital expenditure on mains. We learn from the "Gas Age-Record" that for dairy farms the use of gas has proved advantageous in increasing milk production. This is accomplished by tempering the drinking water of the stock. The Western United Gas and Electric Company have an installation where gas is employed to keep the drinking water for the cattle at a temperature *circa* 50° Fahr.; and during the first year the gas bill was more than paid for out of the extra milk obtained. Another agricultural use for gas is the curing of hay. This is done by covering the hay with a tarpaulin and then running a pipe from a gas-fired air heater into the middle of the stack. Experiments on this application have been carried out at Purdue University with considerable success.

Appliance Operation and Variations in Gas Supply.

A valuable investigation has been carried out at the Cleveland Testing Laboratory of the American Gas Association into the effect of variations in gas supply on the working of gas appliances, for which study a number of appliances, particularly gas ranges, with different designs of burners, were selected for operation under varying conditions. As a result, it was found that variations in gas pressure affect the gas rate of a given setting of the burner orifice directly as the square root of the pressures. An increase in pressure increases the gas rate and tends to result in the overcrowding of the burner and incomplete combustion. A change in specific gravity affects the gas rate inversely as the square root of the specific gravity; air injection increases as the specific gravity increases, and the combustion characteristics are materially altered. Heating value changes are similar in effect to variations in pressure. An increase in heating value tends towards overcrowding the burner, and incomplete combustion, unless readjustment of the burner is made. A decrease in heating value tends towards flash-back and noisy burner operation. Chemical composition is probably the controlling factor in considering the effect of various gases on appliance performance, states Mr. F. E. Vandaveer, Supervisor to the Laboratory, in outlining the investigation in a recent issue of the "Gas Age-Record." And results of changing the hydrogen, hydrocarbon, carbon monoxide, and inert content of gases, maintaining the heating value, specific gravity, and pressure constant are to be published later by the "A.G.A."

Advertising Gas Heating.

In Bournemouth gas is certainly regarded as the modern fuel. There are more than 70,000 gas fires fixed, and of these about 10,000 are in the bedrooms of hotels or boarding-houses. Most of our readers will remember the paper which Mr. P. G. G. Moon, Engineer and General Manager of the Bournemouth Gas and Water Company, read at the Eastbourne Conference of the British Commercial Gas Association last year. Gas heating has proved a boon not only to the visitor, but also to the hotel proprietor, as will be gathered from the fact that half the inquiries received by one of the principal hotels from prospective Christmas visitors contained requests for rooms fitted with gas fires. And these fires, by the way, are "fitted" as distinct from being "put in." Piping is concealed, and the prepayment meter is accommodated in artistic fashion, as befits a modern fuel. All this enthusiasm for gas heating is not gained merely by desiring it. Such goodwill has to be earned; and Mr. Moon undoubtedly does his part in the matter of advertising. Practically every means for impressing on the public the virtues of gas heating is exploited; and even the tickets of the Bournemouth Corporation Tramways have been brought into service to advertise gas fires.

PERSONAL

BRITISH ROAD TAR ASSOCIATION.

Appointment of New Chairman.

Mr. REGINALD G. CLARRY, ex M.P. for the Newport Division of Monmouthshire, has been appointed Chairman of the British Road Tar Association, whose Offices are at 17, Grosvenor Gardens, S.W. 1.

Mr. Clarry, who was born in Derby, was trained in civil engineering and chemistry, and had an active and successful business career before taking up politics. During the war he was Hon. Adviser to the High Explosives Department of the Ministry of Munitions, and later took complete control of the Duffryn Steel and Tin Plate Works, Morriston, Glam., where 100,000 tons of coal per annum were used as fuel. He was quick to recognize the extremely valuable distillation products of coal in bye-product recovery coke ovens, and has always appreciated the great potentialities of coal tar, whether treated in gas-works or coke ovens.

It was in 1922 that he stood for the Newport Division of Monmouthshire, in a by-election that became historic. For, standing as an independent Conservative in a constituency that had always been Liberal, and against both Coalition and Socialist candidates, his prospects appeared hopeless; yet he won the seat by a substantial majority. It was within a few hours of this sensational victory that the Coalition Government collapsed. In the three General Elections which followed in quick succession Mr. Clarry was equally successful, so that he holds what is believed to be a political record, that of having fought and won four Parliamentary contests in two years. He held the seat until the General Election of last year.

Mr. Clarry is a keen sportsman and lover of the open air. He will long be remembered for his campaign—unfortunately not successful—to induce the authorities to instal a gymnasium in the House of Commons, so that the members could keep physically fit. This once drew from Mr. Jack Jones the sally that the Hon. and athletic member for Newport would soon be wanting a diving-board on the Terrace!

He was also the originator of mass visits to the House by large parties of electors from country constituencies. On the first occasion 1000 Newport people, mostly women, travelled in two special trains, visited Mr. Clarry at the House, and were entertained at tea in the Central Hall, Westminster, in the company of Mr. Baldwin.

Mr. Clarry was one of the earliest motorists, and drove an old Benz car with tiller steering in the pioneer days; and no doubt his powers of endurance stood him in good stead.

The appointment of Mr. Reginald Clarry to this new post synchronizes with the growing importance and strength of the

MR. REGINALD G. CLARRY.

British Road Tar Association. Originally founded in 1925, it now has a membership of some 710 firms in the gas, coke-oven, and tar distilling industries which between them treat

35 million tons of coal a year, producing 2 million tons of crude tar and employing nearly 200,000 workpeople.

The Association seeks to enlarge the market for British tar, and especially to encourage the use of British tar on British roads. As a direct result of the suggestions it put forward, the official Road Board Specifications for the different grades of tar have lately been tightened up. At the same time the Association is continuing to obtain even greater uniformity in quality.

Road tar was the first material of its kind in the field, and thanks to the improvements which have been effected in its quality and character it continues to be supreme, despite the efforts made to supplant it from this position. Tar, indeed, has many points in its favour. Not only is it an all-British product, scientifically prepared, economical in use, and capable of giving entirely satisfactory results, but it possesses this further advantage—it can be laid speedily with little interruption to traffic by unskilled labour under skilled supervision.

While the Association has confined its research work to the laying of experimental stretches of road in different parts of the country, it has established close relations with the various organizations and Government departments interested in road building, and has kept a careful record of all new developments. By means of the facilities which it provides, the latest technical information and advice on all questions relating to the tar treatment of roads are now available to road authorities not only in this country, but throughout the world.

Mr. ALEXANDER KERR, who has retired after 35 years' service as Assistant Foreman Engineer at the Edinburgh Corporation Gas-Works, has been presented with a wallet of treasury notes by his fellow employees.

OBITUARY

C. B. TULLY.

The death occurred on Aug. 27 of the originator of Tully gas—Mr. C. B. Tully, Chairman of Messrs. Tully, Sons, & Co., Ltd., of Newark-on-Trent. Deceased attended the recent meeting of the Irish Association of Gas Managers, and appeared to be in the best of health. On Friday, Aug. 22, he crossed over to Ardrossan; and on the following morning called at the office of Mr. David Vass, Engineer and Manager

to the Perth Gas Department. He was on the point of leaving Mr. Vass when he had a seizure, which necessitated his removal to the Perth Royal Infirmary, where he died on the following Wednesday.

Born in the City of London, deceased was educated at the Stationers' Company School, Bolt Court, Fleet Street—an address which must be familiar to most gas engineers and managers. He commenced his career with his father, Mr. T. D. Tully, when he held the position of Distribution Engineer of the old London Gas Company, Nine Elms. Deceased acted as assistant to his father, taking charge of all the main-laying works. He superintended the laying of the earliest 48-in. mains in the London streets—a great affair in those days. After leaving Nine Elms, Mr. Tully entered into partnership with Messrs. Dixon & Co., a firm of engineers having extensive works at Battersea, and was engaged in several important contracts for ironwork. For two years he was Works Foreman at the Athol Street Station of the Liverpool United Gas Company, whence he went to take up the position of Engineer and Manager to the Sligo Gaslight and Coke Company. Sligo was first lighted with gas in 1855, but not till 1893 did the Company possess any statutory powers. In that year, however, the Company applied for, and obtained, a Provisional Order, the work attending this application falling chiefly upon Mr. Tully. An active member of the North of Ireland Gas Managers' Association, he read, in August, 1895, a paper on "The Advantages of a Provisional Order for Gas Companies."

It was when he was Manager of the Sligo Gas-Works that Mr. Tully invented his "methane-hydrogen" plant, which he described in a paper before the Irish Association of Gas Managers in 1902. In a further communication, in 1905, we find that the plant is being used in conjunction with a carburettor and superheater. The next publication concerns the plant which has now been adopted for the complete gasification of coal, and which proved of such great value during the war. Since 1919, the Tully plant has undergone many improvements; and there exist to-day works which are distributing Tully gas solely.

Mr. JAMES ELDRIDGE, who served the Oxford and District Gas Company for about fifty years, for the greater part of the time in the capacity of Engineer and Manager, and who retired in September, 1916, died on Wednesday, Aug. 27, at the age of 87.

FORTHCOMING ENGAGEMENTS

Sept. 8-11.—ASSOCIATION OF PUBLIC LIGHTING ENGINEERS.—Annual Meeting and Conference at Leicester.

Sept. 9.—FEDERATION OF GAS EMPLOYERS.—Meeting of the Central Committee.

Sept. 9.—NATIONAL GAS COUNCIL.—Meeting of the Central Executive Board.

Sept. 9.—INSTITUTION OF GAS ENGINEERS.—Meeting of Education Committee (4 p.m.), 28, Grosvenor Gardens, S.W. 1.

Sept. 11.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Annual Meeting at Aberdeen.

Sept. 17.—INSTITUTION OF GAS ENGINEERS.—Meetings of Executive Committee (10 a.m.), Finance Committee (12 noon), and Corrosion of Pipes Sub-Committee (2 p.m.), 28, Grosvenor Gardens, S.W. 1.

Sept. 18.—WALES AND MONMOUTHSHIRE DISTRICT INSTITUTION OF GAS ENGINEERS AND MANAGERS.—General Meeting at Porthcawl.

Sept. 18.—SOCIETY OF BRITISH GAS INDUSTRIES.—Council Meeting in the afternoon.

Sept. 18.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Meeting at the Incorporated Accountants' Hall, Victoria Embankment, W.C. 2, at 2.30 p.m.

Sept. 22-24.—CERAMIC SOCIETY.—Joint meeting of the Refractory Materials Section and the Building Materials Section, in London.

Sept. 23.—INSTITUTION OF GAS ENGINEERS.—Meeting of Education Committee (4 p.m.), 28, Grosvenor Gardens, S.W. 1.

Sept. 26-28.—NATIONAL SMOKE ABATEMENT SOCIETY.—Annual Conference at Leicester.

Oct. 10.—MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.—Visit to the Partington Gas-Works.

Oct. 15.—EASTERN COUNTIES GAS MANAGERS' ASSOCIATION.—Autumn Meeting in London.

Oct. 22-23.—INSTITUTE OF FUEL.—Annual Conference at the Institution of Electrical Engineers, Victoria Embankment, W.C. 2. Annual dinner at the Connaught Rooms, Great Queen Street, W.C. 2, on Oct. 22.

Oct. 27 to 29.—BRITISH COMMERCIAL GAS ASSOCIATION.—Annual Meeting at Hull and Bridlington.

Nov. 19.—SOCIETY OF BRITISH GAS INDUSTRIES.—Autumn General Meeting in London.

Nov. 25-26.—INSTITUTION OF GAS ENGINEERS.—Autumn Meeting at the Incorporated Accountants' Hall, Victoria Embankment, W.C. 2.

THE NEWS OF THE WEEK

Public Lighting Engineers are to recognise the valued services of Capt. W. J. Liberty by presenting him with a gift. The presentation will be made at the Leicester Conference of the Association of Public Lighting Engineers, which is to be held on Sept. 8-11.

Motor Car Headlights rescued a military band from gloom at Margate on the evening of Aug. 23, when Margate and the surrounding district suffered from a failure of the electricity supply. The only areas of brightness were where the gas street lights shone, as usual, undisturbed. The performances at theatres and other places of amusement had to be suspended and in some cases cancelled.

More Meters Are Being Tested by the Glasgow Gas Meter Testing Department. During the year ended May 31 last, the number was 38,005 and the amount of fees collected £2320. Of the meters tested, 11,154 were new, 26,409 were repaired meters, and 442 were sent in by gas consumers for certification as to correctness. In regard to the meters sent in by consumers, 54·5 p.ct. were rejected; 143 being fast in registration. These figures are taken from the report of Mr. S. B. Langlands, the Inspector.

Sir John Cass Technical Institute commences its new session on Sept. 22. The session extends over about 36 weeks, and students will be enrolled during the week preceding Sept. 22. The Institute provides instruction in fuel technology, including coal carbonization and gas manufacture. Full facilities are provided in well-equipped laboratories for special investigations and research. The Principal or heads of departments will be pleased to advise intending students at the commencement of the session on the course they should undertake.

A Distinct Advance in Coke Handling has been made at the Beckton Works of the Gas Light and Coke Company. We referred to this in the "JOURNAL" for Aug. 13, when we announced the placing of the contract for the extensive coke handling plant at Beckton with Messrs. West's Gas Improvement Company, Ltd. We are now asked to state that the plant is to deal with coke not only from the new coke oven plant, but from the existing horizontal retort installations. The arrangement of the plant was designed in its entirety by the Technical Staff of the Gas Light and Coke Company, and it constitutes a distinct advance in the art and practice of coke handling and preparation.

An Aluminium Powder Specification has been published by the British Engineering Standards Association. This is B.E.S.A. Specification for Aluminium Powder for Paints (No. 388-1930), and is the last of the series of sixty-one British Standard Specifications for Paints, Varnishes, and Paint Ingredients. The Specification follows the lines of those previously issued, containing clauses regulating the composition, standard reception tests, and appendices outlining standard methods for carrying out the tests. Copies of the new Specification may be obtained from the Publications Department, British Engineering Standards Association, 28, Victoria Street, Westminster, S.W.1, price 2s. 2d., post free.

The Yorkshire Gas Grid was the subject of an extraordinary meeting of the Sheffield Gas Company on Friday last, when approval was given to the Draft Special Order for which application has been made to the Board of Trade for the raising of additional loan capital. Col. Stephenson, the Chairman, explained that the Area Gas Supply Committee reported to the Government that they recommend there should be a gas grid and that the coke ovens in the South Yorkshire district should be organized and gas conveyed from them in a systematized manner to the industrial area with a view to supplying the industries of Sheffield and district with cheap gas. The Committee were divided as to ownership of the grid, and the Gas Company thought it was their duty, as well as a matter of self-defence, to take ownership. If any other ownership came into being they would be supplying gas in the Company's area and would take from the Company something of their goodwill which had been created by their capital and industry in the past. It would be necessary for the Company to increase their borrowing powers; and they proposed to apply for new borrowing powers so as to increase the total borrowing powers to 65 p.ct. of the paid-up capital or £1,129,000. They had already borrowed £580,000, so the balance to be borrowed under the powers was £549,000, which they considered would be ample for the purpose.

Special Rates for Pottery Firing have been considered by the Stoke-on-Trent Gas Committee, who have decided that, in the event of manufacturers using town gas for pottery firing, they be granted special rates of 1s. 9d. per 1000 c.ft. net for a consumption of 5 million c.ft. of gas per annum and over, up to 15 millions. If the consumption is 15 millions or over per annum, the price for the whole quantity consumed during that period is to be 1s. 6d. per 1000 c.ft. net.

Dividend Announcements have been made as follows: The Directors of the Portsmouth Gas Company have recommended, on account of the year ending Dec. 31, 1930, the payment of an interim dividend at the rate of 5 p.ct. per annum on the 5 p.ct. maximum stock, and of 8 p.ct. per annum on the consolidated stock, less income-tax. The Directors of the European Gas Company have decided to pay, on Oct. 1, an interim dividend of 2 p.ct., free of income-tax.

A Civic Reception is to be accorded the Association of Public Lighting Engineers when they visit Leamington Spa on Sept. 11. They will be received by the Mayor of Leamington and the Watch Committee of the Corporation, after which the visitors will be entertained at tea in the Town Hall by the Chairman (Alderman Harold Mason, M.B., J.P.) and the Directors of the Leamington Priors Gas Company. The arrangements for this latter function are being undertaken by Mr. R. S. Ramsden, General Manager and Engineer of the Company. The Lord Mayor and Lady Mayoress of Leicester are expected to accompany the visitors to Leamington.

Dancing till One-Thirty will be one of the attractions at the annual dinner and dance of the Institute of Fuel, which will be held at the Connaught Rooms, Great Queen Street, W.C. 2, on Wednesday, Oct. 22. The President, Sir David Milne-Watson, LL.D., D.L., will preside; and he and Lady Milne-Watson will receive the members and guests at 6.45, and dinner will be served at 7.15 p.m. A large number of distinguished guests will be present, and the toast of "The Fuel Industries" will be proposed by The Most Hon. The Marquess of Londonderry, K.G., M.V.O., and responded to by the President. The dinner will be followed by a dance, and a cabaret performance by Mr. Gordon Marsh's troupe will be given in the Banqueting Hall from 11.0 to 11.30 p.m., after which dancing will be continued until 1.30 a.m. The price of tickets, exclusive of wines, but including light refreshments during the dance, will be one guinea each.

Exhibition of Chemical Plant.

Under the auspices of the Dechema (Deutsche Gesellschaft Für Chemisches Apparatewesen), the sixth Achema Exhibition (Ausstellung Für Chemisches Apparatewesen) was held in Frankfurt am Maine from June 10 to 22. The exhibition guide, copies of which are still obtainable at the offices of the Dechema, Seelze bei Hannover, price 1 Reichsmark, contains an alphabetical list of the exhibitors and a classified list of exhibits. The classified list indicates the names of all the exhibitors of each type of plant. Among the firms which had stands are to be found the names of the A.E.G., Bamag-Meguin, Carbo-Norit-Union, Walther Feld, Junkers-Thermo-Technik, Heinrich Koppers, Mannesmannröhren-Werke, Mono, Dr. Otto & Co., Dr. F. Raschig, Siemens & Halske, the Stettiner Chamotte-Fabrik, and a host of others well known in the gas industry. Other branches of chemical industry were equally adequately represented, and it is superfluous, therefore, to give any indication as to the wide variety of plant on view.

It may be of interest to indicate that the object of the Dechema is to further development in the sphere of chemical apparatus and machinery in the widest sense. The aims are achieved by discussions, circulation of information, formation of committees on special problems, prizes for outstanding inventions, and subsidies for research work and exhibitions. The membership fee is 20 RM. per annum for individuals and 30, 50, or 100 RM. for firms, depending on the importance of the firm. A firm may select the fee which it considers appropriate to itself. Among benefits to which members are entitled may be mentioned a free copy of the weekly periodical Chemfa ("The Chemical Plant") and of the Achema Year Book, copies of Din-Denog standard specifications at reduced rates, books published by Dechema at reduced rates or free of charge, free entrance to the Achema exhibitions and reduced stand fees, and free information as to suppliers of chemical plant.

XUM

Ministry of Labour Report.

Unemployment Grants.

The report of the Ministry of Labour for the year 1929 states that Employment Exchanges succeeded in filling 22,196 vacancies in gas, water, and electricity undertakings.

Schemes approved by the Unemployment Grants Committee during the year 1929 were in respect of works estimated to be carried out at a cost of £20,284,711, while the total estimated cost of works approved by the Development (Public Utility) Advisory Committee appointed under Part I. of the Development (Loans, Guarantees, and Grants) Act, 1929, amounted to £8,490,738. This latter Committee deals with applications submitted by statutory public utility undertakings trading for profit, for grants of State assistance towards schemes of work calculated to promote employment.

The Unemployment Grants Committee appointed by the Treasury has been reappointed by the Minister of Labour to act as the Committee responsible under Part II. of the Development (Loan, Guarantees, and Grants) Act, 1929 (which came into operation on Aug. 31, 1929), for recommending, with the approval of the Treasury, grants to local authorities and statutory bodies carrying on undertakings, under statutory powers, otherwise than for profit.

The number of Certificates of Exception granted under the Unemployment Insurance Act, 1920, to public utility companies (other than Railways) at Dec. 31, 1929, was 189. Of a total of 2174 so issued, 1221 have been issued to local authorities.

The estimated number of insured persons between the ages of 16 and 64 in Great Britain on July 1, 1929, was 11,834,000, of which 159,560 (including 6080 females) were engaged in gas, water, and electricity supply, and 1,074,610 in the coal mining industry. Of a total of 98 industrial disputes settled by the Ministry during the year under review, only one case concerned the public utility services. The Unemployment (Relief Works) Act, 1920, has been extended for a further period to Dec. 31, 1930, and the certificates issued under sections 1 and 2 of the Act number 38.

Parent Coal Carbonisation Trust Holds First Meeting.

The First Ordinary Meeting of the Parent Coal Carbonisation Trust was held in London on Aug. 19—Lord ASKWITH presiding.

Lord ASKWITH said that the accounts, which were made up to May 31, 1930, covered a period of a little over fifteen months from the date of incorporation. Fordhans Trust, the underwriters of the issue, in March, 1929, had failed to fulfil their obligations, and had since gone into liquidation. The matter was in the hands of the Company's solicitors. The Board had secured the co-operation and assistance of the largest shareholders, and obtained their undertaking to provide, on favourable terms, the funds required to complete the first installation of plant to work the Company's secret process for low-temperature carbonization of coal. The first installation had been erected at Belvedere, in Kent, on a site adjoining the Thames.

Two retorts had been erected, which were capable of dealing with 50 tons a day, together with storage tanks, gas producing plant, and all the other auxiliaries required for the complete installation. Within a short time they should obtain a regular production of their smokeless fuel, gas, and crude oil. It was their intention to proceed with the equipment of their refinery in due course for the production of crude oil and motor spirit. To provide for ample supplies of the most suitable coal for their installation and process they had entered into an agreement to acquire certain collieries and mining leases in Campbeltown and North Wales. Plans were ready for the erection of a carbonization plant at Campbeltown.

Shareholders asked what amount of working funds the Company had left in order to complete the plant at Campbeltown. They also desired to know if an effort would be made to persuade the Stock Exchange Committee to allow the shares to be dealt in. They requested Lord Askwith to explain to the Committee that the Company, because it got into the hands of the "company mongers," had been "more sinned against than sinning."

The CHAIRMAN replied that he had dealt at the statutory meeting with most of the points raised now. He was convinced that when the Company's process had been proved in this country, and that the Committee had realized that this was not a Company promoted by underwriters for their own benefit, they would allow the shares to be quoted.

Mr. HAYWARD, a shareholder, said he was not satisfied with the Chairman's reply. "We have got no working capital," he said. "It was paid away right from the start." He would like to point out, he added, that the prospectus suggested that working plants would be ready by August, 1929. One of those

was for ten times the size of the "two wretched things which they had put down at Belvedere." What was the use of their purchasing world rights, he asked, when they had not started in their own country?

The CHAIRMAN again referred to his remarks at the statutory meeting, and read a statement he had made then.

The report having been seconded, he declared it carried, remarking he had seen no hands raised against the motion. Immediately there was an insistent demand for a vote.

This showed a majority of two against, and a shareholder said he would demand a poll.

Amid some excitement, the Chairman decided to have a recount, which resulted in a majority of two in favour of the adoption of the report.

Temperature Control for Industrial Appliances.

In a recent article in "Industrial Gas," Mr. W. D. Crouch states that, if dependable temperature controllers were not obtainable, many devices now used in great numbers would be wholly impracticable. In fact, without the assurance that accompanies the knowledge that certain important units of our daily business and home life were equipped with some form of temperature regulator, those units could not render the valuable service expected of them. In the modern homes of to-day we find gas-fired house-heating units, gas-fired refrigerators, gas-fired instantaneous or storage type water heaters, gas-fired laundry driers, &c., none of which could be depended upon to render continuous service except when regulated by dependable temperature controllers.

The application of dependable temperature controlling devices to industrial appliances is, from a purely economic viewpoint, as vitally necessary as on the domestic units mentioned in the foregoing paragraph. The economies obtainable by the use of temperature controllers amount to a very considerable item during a period of twelve months. In many cases the aggregate savings are sufficient to amortize the cost of the instrument and its installation within an extremely short time, and the device proves to be a very profitable investment.

Automatic temperature controllers, Mr. Crouch goes on to say, can be installed with the assurance that the following detailed economies will be secured:

A Reduction in Fuel Cost by preventing excess temperatures. All fuel thus wasted with manual control will be saved, and these economies range from 10 to 40 p.ct., the percentage being governed by the established routine.

A Decreased Labour Cost by making it unnecessary for an employee constantly to watch the temperatures. This saving, in many cases, amounts to many times the cost of the temperature controller.

A Saving of Material by preventing damages and losses caused by incorrect temperatures. It is possible in some cases to damage or destroy, within a few hours, much valuable material. Dependable temperature controllers insure the user against losses caused by variable temperatures.

Protection for the Appliance is obtainable by the use of temperature controlling devices. Excess heat may cause damage that may require a considerable outlay of effort, money, and time to repair. This damage may happen at a critical time when every appliance must deliver its share of the production.

An Increase in Production is obtainable by automatically regulating the temperatures of industrial appliances, as the work may be continuous.

The economies listed are definitely obtainable. These statements are based upon individual experiences and on information obtained from engineers and production managers of a great many manufacturers.

Notes from Scotland.

Dundee Tar Works Problem.

The report of Mr. Walter C. Forbes, the London expert called in by the Dundee Town Council to investigate the condition of the tar distillation works, has been issued to the members of the Council

In the course of the general report it is stated that it is clear that the distillery has been run at a loss for the past four years. If all technical improvements are made there is a reasonable probability that working costs can be reduced by £2000 per annum. Complete reconstruction of the works costing about £8000 would probably increase the annual saving to £2500 per annum. There is no prospect of increased revenue being obtained by the installation of plant for the production of rectified products. An analysis of the tar has proved its unsuitability as a raw material for such a process. The loss for the past four years has been in the neighbourhood of £2500 per annum. It would appear that technical improvements would not of themselves do more than balance the account. Any profit must come from enhanced prices for finished products. There would appear to be little hope that a continuance of the

THE NEWS—*continued.*

present policy will do other than repeat the history of the past four years.

ALTERNATIVES.

The alternatives, according to Mr. Forbes, are: (*a*) To dispose of the production of crude tar in the open market; (*b*) to co-operate with an organization which possesses the expert technical and sales organization demanded by the market situation.

This alternative of direct sale, he says, has one attractive feature—its simplicity. It is extremely doubtful, however, if in a surfeited market a low quality product would demand a ready sale at other than sacrifice prices. There is, however, one objection to direct sale which would in this particular case appear to be fatal. Such a policy involves scrapping the distillation works. This works stands in the books at a depreciated value of over £14,000. The loss involved in scrapping would fall on the Gas Department, and would have to be liquidated.

Mr. Forbes observes that he has for this reason felt it imperative to make a recommendation free from this defect.

It has been noted, the report continues, that better technical and marketing control is essential to the success of the distillery. It has been further noted that the volume of crude tar is not large enough to bear the oncost of such an organization. The co-operation with other tar producers gives a larger bulk of raw material; co-operation with distillers ensures expert technical and sales management.

Mr. Forbes accordingly recommends as follows:

That the Corporation should enter into an agreement with an approved distiller or distillers to distil and market the products of the distillation of its entire output of crude tar on a profit-sharing basis.

A Suggestion for the Lochee Gasholder.

The latest proposal for the utilization of the collapsed gasholder at Lochee is that it should be conveyed to Broughty Ferry and erected there in two years' time.

At a meeting of the Gas Committee of Dundee Town Council on Aug. 18, a letter was submitted from Robert Dempster & Sons, Ltd., regarding their quotation for pulling down and re-erecting the gasholder and steel tank at Lochee. The firm stated that, as a large gasholder contract in Scotland would finish this month, the whole of the erection tackle would be at liberty, and they would be pleased to have the Committee's decision with regard to the acceptance of their offer.

Convener A. A. Leslie moved that the question be remitted to the Sub-Committee already appointed to deal with the gasholder.

The Acting Manager stated that the Lochee gasholder should not be re-erected there, but should be dismantled and conveyed to Broughty Ferry holder station, the parts requiring attention by the makers being returned to their works for adjustment, and the whole carefully painted and stored in Broughty Ferry for erection there during the summer of 1932.

The Convener pointed out that the whole system was carefully considered by the Gas Committee, and according to a report by the Manager as regards the storage system, the policy of decentralization by the erection of gasholders was better than centralization at the works. There was vacant ground near the gas-works, but the Manager pointed out that district gasholders were a greater safeguard to the consumers. In consequence of that report they agreed to dispose of the ground. From the layman's point of view it was a far greater safeguard to the Lochee community to have a gasholder at hand. In the event of a breakdown of the suggested compressor plant, Lochee would be left without a supply, but all these points could be fully dealt with by the Sub-Committee.

After some discussion the question was remitted to the specially appointed Sub-Committee.

Gladdening News has reached gas consumers at Kilbarchan. The Kilbarchan Friendly Societies' Joint Stock Gas Company have reduced the price of gas by 2½d. per 1000 c.ft., making the rate 3s. 9d.

Company Results at June 30.

Morpeth.

The Directors of the Morpeth Gas Light Company (1902), Ltd., present their annual report and balance-sheet for the year ended June 30, 1930, as follows. The gross profit for the year amounts to £2935, which, with £1562 brought forward from last year, gives a sum of £4498 available, out of which a dividend of 6 p.ct. on preference shares is recommended, leaving a balance of undivided profits of £1515. During the year the business of the Company has made steady progress, the output of gas having increased by 884,000 c.ft. to 34,408,000 c.ft., which constitutes a record in the output of gas in Morpeth. In spite of this large increase in the Company's business the gross profits, however, are slightly less at £2935, against £3045 last year, a drop of £109. This is accounted for by the higher price of coal amounting to £314 and the abolition of meter rents to consumers, which has cost the Company £206. The Directors feel that the financial position and the prospects of the Company warrant the distribution of a portion of the general reserve. It is proposed therefore to capitalize £1557 of the reserve fund of undivided profits by issuing to each shareholder one ordinary share of £1 fully paid for each ten ordinary shares held at this date; fractions of 10 shares to receive one ordinary share for each 5 shares or over; holdings of less than 5 shares will not be entitled to any allotment in respect of these. A resolution to carry this into effect will be submitted to the meeting of shareholders.

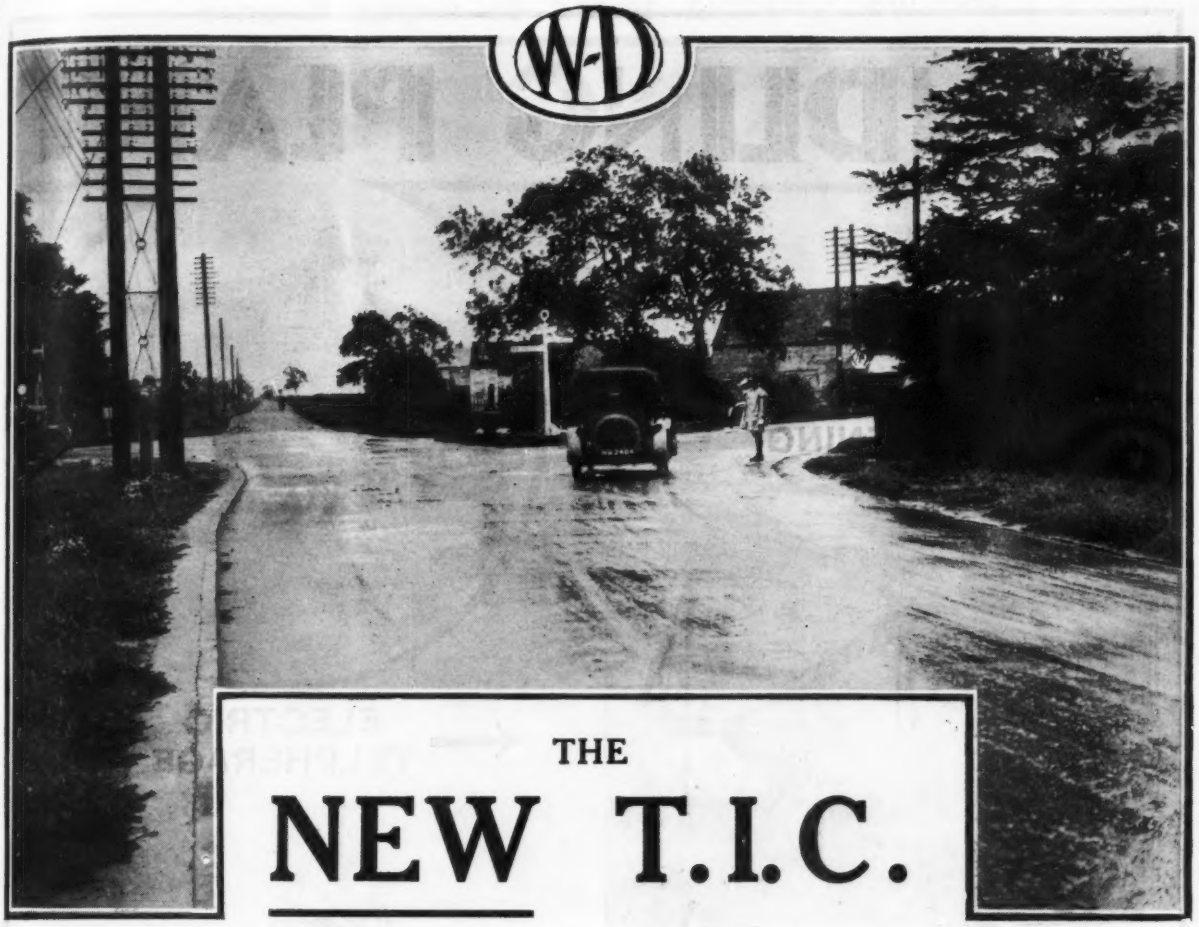
Coke Oven Gas Bought by Authorized Gas Undertakings in 1929

The following quantities of gas were bought from owners of coke ovens by authorized gas undertakings, and appear in the recently issued Board of Trade Return as sold to consumers by those undertakings:

Purchasing Undertaking.	Quantity of Gas Involved.
ENGLAND AND WALES.	C.Ft.
Accrington District Gas and Water Board	580,880,000
Ackworth, Featherstone, Purston, and Sharlston Gas Company	42,803,000
Castleford and Whitwood Gaslight and Coke Company	163,951,000
Chesterfield Corporation	118,892,000
Cleveland Gas Company	27,679,000
Dinnington and District Gas Company, Ltd.	80,325,000
Eckington and Mosborough Gas Company, Ltd.	36,000,000
Houghton-le-Spring District Gas Company	60,654,000
Kidsgrove Gaslight Company	51,604,000
Killamarsh Gas Light and Coke Company, Ltd.	13,019,000
Leeds Corporation	401,102,000
Little Hulton U.D.C.	22,170,000
Middlesbrough Corporation	1,128,687,000
Newcastle-upon-Tyne and Gateshead Gas Company	1,711,895,000
Ossett Corporation	151,675,000
Pontypridd U.D.C.	164,424,000
Port Talbot Corporation	92,747,000
Rawmarsh U.D.C.	87,391,000
Redcar Corporation	151,141,000
Rhymney and Aber Gas Company	333,843,000
Rotherham Corporation	595,346,000
Sheffield Gas Company	3,710,245,000
Staveley Gas Light and Coke Company	15,766,000
Stocksbridge Gas Company	43,519,000
Swinton and Mexborough Gas Board	81,484,000
Tudhoe and Sunderland Bridge Gas Company	18,322,000
Wath, Bolton, and Thurnscoe Gas Board	113,787,000
Wombwell U.D.C.	89,403,000
Worsbroughdale and Worsbrough Gas Light and Coke Company, Ltd.	36,062,000
SCOTLAND.	
Glasgow Corporation	823,425,000
Total	10,948,241,000

The following is a comparative table of the quantities of gas bought from owners of coke ovens by authorized gas undertakings in Great Britain during the years 1921 to 1929:

Year.	Number of Purchasing Undertakings.	Quantity of Coke Oven Gas Bought.	Year.	Number of Purchasing Undertakings.	Quantity of Coke Oven Gas Bought.
		C.Ft.			C.Ft.
1921	14	1,325,027,000	1926	22	2,321,850,000
1922	16	3,635,678,000	1927	24	5,340,223,000
1923	16	4,268,055,000	1928	28	6,560,389,000
1924	18	4,470,914,000	1929	30	10,948,241,000
1925	21	4,797,752,000			



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(Patent applied for)

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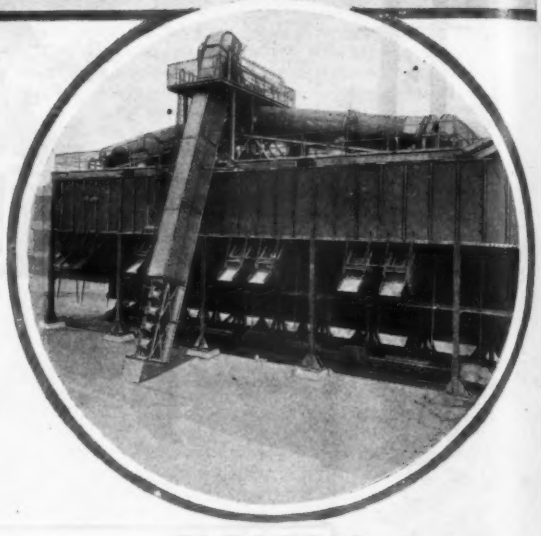
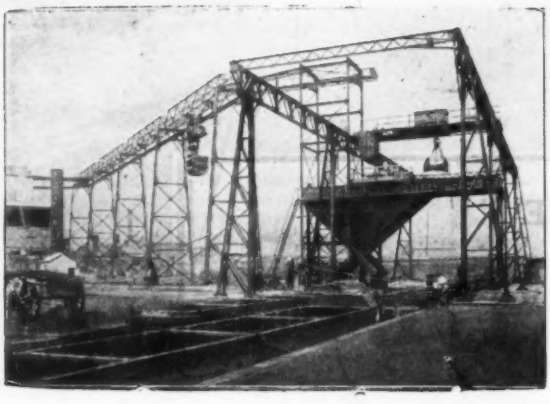
HANDLING PLANT

COKE SCREENING →





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Fine Example of Street Lighting by Gas

In the "JOURNAL" for July 9 last we mentioned that, at the instigation of the Gas Engineer and Manager, Mr. Ernest Hardiker, the Town Council of Smethwick have been experimenting with improved methods of street lighting by gas. The results were so entirely satisfactory to all concerned that it was decided to re-light the whole of the main street, some two miles in length, by means of "Rochester" lamps. The uniformity of the lighting and the absence of glare have met with great appreciation and praise from motorists. The improved lighting is being extended to the secondary roads, and the directive lighting system with higher power units has been adopted, which method will gradually replace the existing system in this class of road. Our photograph shows a portion of the improved street lighting of the town. All the short columns and square lanterns have been removed, and the re-lighting has been carried out by 6-light and 9-light Sugg "Rochester" lamps, suspended from the electric tramway columns at intervals of from 50 to 60 yards, providing effective illumination and splendid visibility.

IN CONTINENTAL COUNTRIES - - -

Abstract Translations from the Technical Press of France and Germany.

RATIONAL APPLICATION OF GAS IN INDUSTRY WITH SPECIAL REFERENCE TO EXPERIENCES WITH BAKING OVENS.

In a useful paper, R. Kapp, "Das Gas- und Wasserfach," 1930, 73, 741-752 (Aug. 9), considers first the heat lost from ovens by radiation and convection, and indicates how the most economical thickness of insulating material may be calculated. The economical thickness increases as the ratio of oven surface to baking surface increases—*i.e.*, it is greater for small ovens than for large ones. This point is hardly ever, if at all, taken into account by manufacturers of ovens.

Heat storage ovens, in which the heat is stored in the brickwork by the consumption of gas and the goods are placed in the heated ovens after the burners have been extinguished, are next considered. Such ovens are intermittent and require reheating between charges. They are indirect-fired in contradistinction to the non-storage type which are direct-fired in that the burners are at work while the goods are being baked. In heat storage ovens, the temperature falls progressively during the baking process; and this had been claimed to be desirable from the point of view of the actual needs of the loaves. However, baking with a constant temperature gives equally good results in the direct-fired ovens, and in this case a new charge can be pushed in as soon as one is withdrawn, or the operation can be completely continuous. Thermostatic control is therefore possible. With such an oven, the heat reserve, being in the burners, is flexible, whereas in the storage type the reverse is the case.

Since the number of charges per day is greater, and hence the radiation and convection loss per charge is less, the direct-fired oven is more economical than is the storage oven. Also, the heat lost during the week-end shut-down is very much less.

Methods for keeping down the heat lost in the flue gas must go hand in hand with improvements in thermal efficiency and operation. Since the temperature is only in the neighbourhood of 200° C., the advantages of preheating are not very important in the case of theoretical combustion. However, since, generally, excess air is used, the importance of preheat is appreciably more. Preheating of the air can then result in an economy of about 10 p.ct., and preheating of the gas in an economy of about 1-2 p.ct.

When different heating systems are compared, various special factors—*e.g.*, economy of space, cleanliness, ease of working, &c.—have to be taken into account in addition to the purely thermal factors. The thermal performance must first be accurately weighed up from the economical point of view, and

the final choice must take into account these special factors, though these must not be stressed unduly.

The question of the parity value of various fuels (including electricity) on a competitive basis is considered with due reference to the efficiency obtained in each case. The parity value of gas rises with the efficiency of the oven, and high priced gas can only compare favourably with solid fuel, oil, and electricity with the most efficient type of ovens. This implies good insulation, absence of thermal storage masses, and direct heating. Only the best oven is good enough, since this alone means reduced operating costs for the consumer and increasing custom for the undertaking. It is important that, in the first place, an encouragement should be given for the switching-over to gas by the fixing of a suitable price for gas. In many instances, gas prices, even when on a sliding-scale, give but slight incentive to this, because of the high capital costs which have to be faced. The actual selling price of the gas must be worked out on the basis of its parity value *plus* the various intangible factors involved—that is to say, the excellence of the baked goods, the large throughput of the ovens, the rapidity of working, the saving in time, the instant availability, the reduction in the labour required for firing, the question of space (no accommodation is required for coal storage or ash dumps), the smallness of the chimney, the high degree of hygiene, and the amenities of the staff. The larger the town, the greater looms the aspect of space; and high ground rent, cost of buildings, and wages all combine to place gas in a favourable position. In all cases, however, the undertaking must set itself out to quote the lowest possible special tariff for bakeries. The special tariff can be, and must be, lower than for central heating, since bakeries are large consumers, and are valuable in that their demands are spread throughout the year and do not put a great strain on the holders and service mains, since the load is taken at off-peak periods.

As regards the comparison of gas ovens among themselves, tests of the throughput and consumption must be carried out with great exactitude. Two or three well-planned and exhaustive tests will solve more problems than will a whole series of incomplete and unco-ordinated tests, and will show what improvements are possible. The comparison must be on a strictly comparable basis. In the case of baking ovens, the following points arise:

(1) The ease of regulation of the heat requirements of the oven.

(2) The test period; this should cover about one week.

(3) Construction and arrangement. Ovens with the same baking surface must be compared. It must be borne in mind that ovens of the shut-down flue type, though possessing many drawbacks, show a gas consumption which may be but one-half of that of ovens with open flues. Regard must also be paid to the ratio of external surface to baking surface, since, as this ratio diminishes, the efficiency increases. As regards location, two ovens next to each other will show a better efficiency than will a single oven. If, for example, two ovens close together show a radiation and convection loss of 40 p.ct., there is a saving of one-fifth of the radiating surface, and an isolated oven would show a radiation and convection loss of 50 p.ct.

(4) The goods and their composition, packing, and size. The comparison must be for uniform conditions, as will be evident from the following example taken from practice:

—	Freely Spaced Loaves.	Loaves in Contact.	Rolls.
Baking loss, p.ct.	13	9	..
Crust, p.ct.	30	15–20	..
Heat required, k.cals./kgm.	150	115	200
Throughput, kgm./m²/hr.	18·7	36	14·8
Individual weight, grammes.	1650	2650	45
Baking time, minutes	60	90	17

With the smaller throughputs, the radiation losses are, of course, appreciably higher.

(5) The efficiency. It must be clearly stated whether the heat required for the water put into the oven for humidification and any heat recovered from the waste gas have been reckoned as useful heat or not. Thus, in the case of loaves in contact, where the danger of cracking is less, the water used is less than in the case for freely spaced loaves, and may perhaps be added every 1½ hours; whereas for the freely spaced loaves it must be added every hour. In the case of rolls, the addition is even more. A distinction must, therefore, be made between net efficiency (pure baking requirements) and gross efficiency (in which the evaporation heat of the water and waste-heat recovery are included). Conditions will be sensibly different according as two full charges or four half charges are put through in a given period.

(6) The gas consumption for a given throughput under comparable conditions as defined above.

AMMONIA RECOVERY.

The economics of ammonia recovery and recent developments are discussed by A. Thau in "Das Gas- und Wasserfach," 1930, **73**, 767-775 (Aug. 16).

It is advantageous to obtain a liquor as concentrated as possible. If the concentration exceeds 2½ p.ct., tightly closed tanks in a cool position must be used. Ammonia may be recovered in the form of pure liquefied ammonia, 0·880 ammonia, concentrated ammonia liquor, sulphate of ammonia, ammonium chloride, and ammonium carbonate. It is often useful for large works to have alternative methods of disposal, so that advantage may be taken of market conditions. However, this overloads the capital costs, since only a portion of the plant is in use at any moment. An exception is the case of plant for the manufacture of concentrated liquor in addition to sulphate, since the extra plant required is small.

During the first few years of working of a sulphate of ammonia plant, 10 p.ct. will cover the capital charges, and maintenance costs are low. In the subsequent years, when the capital cost has been written off, 10 p.ct. will cover the maintenance costs. In plants producing concentrated liquor or 0·880 ammonia, this figure will be somewhat more. The saturator involves the highest cost, owing to the expense of the lead and the cost of lead burning. It can be appreciably lowered by the use of a thinner lead covered with acid-proof tiles. Costs are also lowered if the crude liquor is freed from suspended tar by use of a coke filter, and if incrustations in the still are avoided by proper preparation of the milk of lime and due care is taken that the lime is not added too high up in the column. In a small undertaking, if the still is in constant use, a still-man is continually required. Labour costs can be cut down by the provision of large storage tanks for liquor, the still being employed only at intervals. When it is used, however, it should be run continuously night and day until the stock has been cleared.

In gas-works in which water-gas is manufactured, no waste steam is available, and steam for ammonia recovery must be generated specially. In coke oven plant the cost of steam need be reckoned at only 2s. 6d. per ton, but in gas-works a price as low as this cannot be achieved. The steam costs depend on whether a heat-interchanger is in use between still effluent and crude liquor. Often too much steam is used in the still. The ratio of steam to ammonia in the still vapours should not exceed 6: 1. Too little steam should not be used, since this involves not only loss of ammonia, but formation of an undesirable blue colour in the salt. A steam meter soon pays for itself. In coke-oven practice, steam economy has been effected by the semi-direct process. There is no reason why this should not be adopted in all gas-works save small ones. Fears that the unsaturated hydrocarbons may be taken up by the acid are groundless.

The conversion of a portion of the ammonia into ammonium carbonate is very simple, though rarely practised. The carbonate should not suffer from lack of a market, since it is usefully employed in England for the production of neutral sulphate of ammonia.

Brief reference is made to various recovery processes which have been described from time to time with the object of the utilization of the sulphur content of the carbonization products. The processes referred to are those of Burkheiser, Feld, Cobb, Gesellschaft für Kohlentechnik, Bähr, Muhlert, and Tern; while the Koppers "C.A.S." process is described at greater length.

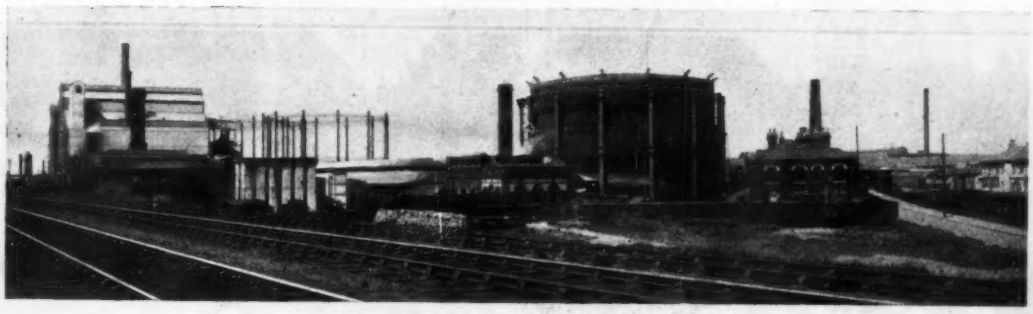
The gas-works has no control over the cost of the sulphuric acid or the selling price of the sulphate of ammonia. The margin between the two represents about £5 10s. per ton of sulphate. This is sufficient, if the liquor is not subjected to too high a transport charge and if the recovery process is carried out under the best conditions.

The low price of sulphate of ammonia has naturally given impetus to the search for a suitable manufacturing process not involving the use of sulphuric acid, the more so since the advances which have been made have given rise to more hopes of ultimate success than appeared likely a few years ago. The fact that these processes have not come into more rapid application in spite of the situation being so favourable to their adoption has been due to hopes, on the one hand, that the processes might be simplified or cheapened, and, on the other hand, that acid prices will not maintain their present level. As against this, however, is the fact that the builders of plants for these processes are prepared to install the plant free of charge and to be reimbursed from the savings accruing from the adoption of the processes. However, this does not apply to small works in which the capital costs of sulphate recovery are relatively too high.

In conclusion, reference is made to the great development of the synthetic ammonia industry and to the excess of supply over demand. Until a price consortium is formed, bitter competition will ensue. This will ruin the bye-product ammonia industry and cause gas prices to rise.

Carbonizing Results from 50-In. Glover-West Verticals*

An Outline of the success of a Glover-West Installation of Continuous Vertical Retorts at West Bromwich.



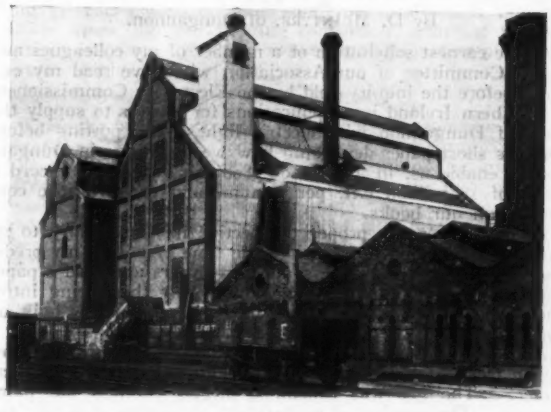
The Gas Undertaking at West Bromwich is now owned by the Municipality. West Bromwich originally formed part of the district supplied by the Birmingham and Staffordshire Gas Light Company, which covered a very large area. In 1875 the powers of this Company were purchased by Birmingham, at which time a clause was inserted in the Bill enabling the outlying districts (subject to arbitration) to erect works for themselves. After lengthy proceedings, West Bromwich, Smethwick, Oldbury, and Tipton availed themselves of this privilege; and the West Bromwich works, situated at Albion, were opened in June, 1880, and gas making and distribution were commenced. The year 1938 is, therefore, the jubilee year of the opening of the works.

Since the commencement of operations, fifty years ago, carbonizing methods have progressed from hand charging of stop-end horizontal retorts, manual machine charged retorts, power charging (De Brouwer) in horizontal retorts, and finally to continuous carbonization in vertical retorts of the Woodall-Duckham and Glover-West types. Carbonization in horizontal retorts has been completely superseded by the use of vertical retorts, one installation of the Woodall-Duckham type being erected in 1913 and one of the Glover-West type in 1928, the first considerable installation of the newly introduced 50-in. retort.

The Glover-West Installation.

The installation of Glover-West vertical retorts comprises two settings, each of which contains eight retorts of the 50-in. "New Model" steaming type, with bench structure and retort-house building extended to allow for the addition of two further settings at a future date. The plant is equipped with four producers, each supplying fuel gas to four retorts. Waste gases from the settings are directed along a main flue, and the surplus heat is utilized in a waste-heat boiler of the Spencer-Bonecourt smoke-tube design. Steam is introduced into an enlarged chamber at the base of each retort for the generation of water gas.

A complete coal handling system serves the installation. Coal is delivered to the works by road or rail, and deposited into a 20-ton hopper. A reciprocating feeder tray feeds the coal at a governed rate into a West single-roll breaker, which reduces it to a maximum grade of 2-in. cubes. The broken coal passes into a West lip-bucket conveyor, in which it is elevated at the rate of 40 tons per hour and dumped into overhead storage bunkers capable of storing sufficient coal for 48 hours' supply to the whole of the retorts. In the case of small coal, which does not require breaking, a by-pass chute diverts it into a lip-bucket conveyor without passing through the breaker. The same line of conveyor takes the coke discharged from the retorts and elevates it at the rate of 20 tons per hour to the producer and retort feed hopper, or carries it along a loop extending beyond the retort-house gable to the coke-screening and storage unit. This comprises an electrically driven coke screen of the rotary type, arranged over a battery of steel-framed, brick-panelled storage hoppers having a total capacity of 200 tons of graded coke. The retort house is equipped with a 20-cwt. electric passenger lift giving access to the producer charging, retort charging, and bunker levels. Gas-making in the Glover-West plant commenced on Oct. 31, 1928. The coals used for gas production are Notts and Derby, Yorkshire, and North Staffordshire; the average mixture of these fuels is usually 75 p.ct., 15 p.ct., and 10 p.ct. respectively. During the year ended March 31, 1930, the whole of the gas was produced from coal carbonized in vertical retorts, mainly by the Glover-West plant. The yield of gas per ton at normal temperature and pressure was 18,731 c.ft., equal to 84·44 therms per ton. The average calorific value of the gas, as recorded by the official tests of the Gas Examiner, was 452·8 B.Th.U., the declared calorific value being 450 B.Th.U.



The following table gives actual working results for three separate four-week periods under ordinary working conditions by the Glover-West vertical retorts :—

—	Four Weeks to May 14, 1930.	Four Weeks to June 11, 1930.	Four Weeks to July 9, 1930.
Coal carbonized	1,779 tons	1,667 tons	1,692 tons
Gas produced per ton of coal, N.T.P.	18,786 c.ft.	18,522 c.ft.	18,566 c.ft.
Therms per ton	84·07	83·40	83·53

These figures show that, after the continuous working of these retorts for a period of nearly two years, the results are well above those guaranteed by Messrs. West's Gas Improvement Company, Ltd.

J. W. A.

* From the current issue of "West's Gas."

THE "JOURNAL" TECHNICAL RECORD

Which also contains Full Reports of Meetings of Gas and Allied Associations ——

Irish Association of Gas Managers

(This concludes our report of the annual meeting in Dublin. Previous instalments were published in the "JOURNAL" for Aug 20 and Aug. 27)

PHOTOGRAPHED AT GREYSTONES.

PROGRESS AT DUNGANNON.

By D. McIntyre, of Dungannon.

At the earnest solicitation of a number of my colleagues and of the Committee of our Association who have read my evidence before the inquiry held by the Electricity Commissioners of Northern Ireland into applications for powers to supply the town of Dungannon with electric light, I am putting before you this short paper describing how we do things in Dungannon to enable us, in a town of 3800 inhabitants, to record a make of 18 million c.ft. per annum, and to have 1000 consumers on our books.

In order to get a proper perspective it is necessary to go back a good number of years to the time of one of my predecessors who, I understand, some thirty years ago read a paper on the prepayment meter, which was only then being introduced and on which since that time we have largely built up our business.

As far back as 1904 the Dungannon Gas Company were supplying free installations of three brackets with each prepayment meter. The gas was consumed largely through flat flame burners. The number of prepayment consumers was 140, and the average yearly consumption per meter was 3600 c.ft. The ordinary consumers at that time were 378, and the average yearly consumption per consumer was 15,300 c.ft. It will be seen that there was an enormous difference in consumption between the two types of consumers. Something therefore required to be done to level up the two classes. About that time the inverted burner was coming into use, and we decided to supply the "Star" inverted burner (which was a fairly economical burner consuming about 2½ c.ft. per hour and giving at our then existing price six hours' light for 1d.) at the cost price of 4s. each complete, and to supply a boiling ring free of charge to all our prepayment consumers who applied for them. This gave the business a considerable advantage, so that by the year 1914 our prepayment consumers numbered 400, and the average yearly consumption per meter was 5500 c.ft. The ordinary meters remained practically stationary. In the same period they only increased by 22 to 400, but the average yearly consumption had increased considerably to 20,300 c.ft. per meter, which was due to hiring out cookers and supplying boiling rings, &c., cheaply.

Object Lesson of War and Strikes.

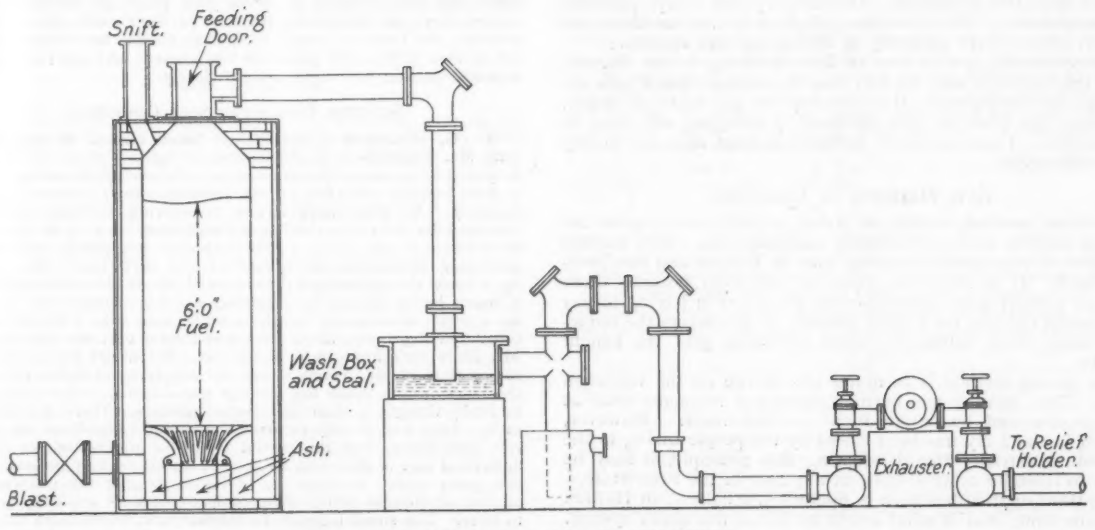
There was very little increase in the number of prepayment consumers between the years 1914 and 1924. They increased to 440. The average consumption per consumer, however, increased to 8900 c.ft., due largely to the high price and scarcity of coal during the war period and to the miners' strikes. The consumers were given a good object lesson during those years of the usefulness of gas which they have not so far forgotten. The ordinary consumers during this period remained stationary at 400, and the average consumption declined to 19,500 c.ft. per meter. This decline was due to the factories and a number of shops in the district installing their own electric light plants.

The prepayment consumers have increased considerably during the past five years. They now number well over 600. This increase is solely due to the number of subsidy houses being built in the district. All these houses are equipped, even to the globes and mantles, free of charge. Subsidy houses at present being built are having five lights supplied, a one-light pendant each in the kitchen, sitting-room, and hall, and a bracket each in the bathroom and scullery. We have also installed a point in each bedroom in case the consumer requires a light there also. We have also a pipe of suitable size laid ready for connecting to a cooker, as we hope the tenant in time will have one installed. The average yearly consumption per prepayment meter has now increased to 10,700 c.ft. This is due to cookers being rented out at a low hire rate. By hiring out the latest and best type of cooker we have installed up to 100 cookers during the past two years, and we have also been able to introduce a few gas fires.

We are now reducing the price of gas for cooking and heating by 2s. 1d. to 5s. per 1000 c.ft. Our lighting rate is 7s. 1d. per 1000 c.ft. We hope this new price will give an impetus to the use of gas for cooking, and that our ambition to have a cooker in every house will soon be realized.

Service to the Consumer.

In the past we have tried to give good service to our customers. We have supplied them with the services of fitters free of charge for repairing leaks, cleaning burners, and keeping their gas fittings up-to-date. We hope to do more in the future, such as supplying new burners of the best type where they are



PRODUCER GAS PLANT AT DUNGANNON.

required free of charge. I am also considering sending a fitter round periodically to inspect the consumers' fittings to see that they are in the best condition to give the best results.

It is necessary to keep the consumer in a happy, contented mood, and as one of the chief sources of irritation is a varying quality of gas it is necessary to see that there is very little variation. You are all perfectly well aware how difficult it is in a small works to keep the gas to an unvarying quality. There is always something going wrong. A stoker does a bit of overpulling or holes develop in the retorts, with disastrous results.

My remedy is to install a small blue water gas plant or a Tully plant, so that by mixing the coal gas with the blue water gas or the Tully gas it is possible to get a practically straight line as regards quality.

Conversion of Water Gas Plant.

The accompanying drawing is a rough diagram of a producer gas plant as it is now being worked at Dungannon. When it was installed it was worked as a blue water gas plant. One man was constantly in attendance shifting the valves for the different cycles (blow and make) and looking after the steam boiler. I decided to dispense with the services of the man, so I connected an exhauster to the plant and converted it into a producer gas plant. I have not regretted making the change. The producer gas mixes with the coal gas quite as well as the blue water gas did; in fact I could find no difference between the two mixtures.

The method of working the plant is as follows: The stokers fill the producer with coke and the feeding door is closed. The fan is put into operation for 15-30 minutes, until the gas lights at the Snift valve. The fan is then stopped and the Snift valve is closed. The exhauster is then put into operation, and the steam is turned on to the producer. The plant is then making gas and delivering it into a 25,000 c.ft. relief holder, and there is no further trouble, beyond keeping up steam.

We make a good quality coal gas, 10,000 to 11,000 c.ft. per ton, and mix with this about 5000 c.ft. of producer gas. The resultant mixture works out at 15,000 c.ft. per ton of 500 B.Th.U. gas.

For mixing, the producer gas is taken from the holder and introduced at the foul main. In the retort house we have a Simmance-Abady indicating calorimeter, which receives its gas supply from the inlet to the holder into which the mixed gas is travelling. We have also a calorimeter of the same type in the governor house connected to the main leading to the town. The one calorimeter is therefore a check on the other. When the stokers see the least variation of quality showing on the retort house calorimeter they turn off or on the producer gas, and are thus able to keep a very level quality of gas.

I hope this short paper, although it may not contain much new information, will raise a discussion that will be of benefit to all.

GAS SALES AT CARLOW.

By L. G. Young, of Carlow.

In bringing this short paper before your notice, I wish it to be distinctly understood that I do not claim that we have adopted any original or novel scheme to further the consumption of gas at Carlow. We have only done what has been done elsewhere, but if the paper produces a good discussion I, along with others, may learn something of how to promote the sales of gas. If that is so I shall be more than repaid for the little trouble I have taken in preparing my paper.

The Carlow Gas Company, from the earliest days of its history, has had to meet competition, because it started in opposition to a gas-works already in existence. After a short time, as might be expected, the two companies amalgamated. Like other Irish gas undertakings, its career has consisted of a series of ups and downs—mostly downs.

Carlow was the first town in the Irish Free State to adopt electricity, even before Dublin. The consumption of gas immediately before the introduction of electricity was 4 million c.ft. per annum, and now it is about 20 million c.ft. per annum. As Carlow was the first gas undertaking to meet electrical competition, it was natural that we should be the first to turn our attention to the development of cooking, heating, power, and slot installations to make up any loss that might be incurred. To encourage the use of gas in these directions we made a reduction of 5d. per 1000 c.ft. in the charge for cooking and heating, and a reduction of 1s. 3d. per 1000 c.ft. for power. At the time of the outbreak of war, our prices at Carlow were 3s. 9d. per 1000 c.ft. for lighting, 3s. 4d. for cooking and heating, and 2s. 6d. for power.

Even at these prices, inroads were made upon our lighting and power load. Suction gas captured all our large engines and electricity took all our small ones, although the small power users, like our lighting consumers, admitted that electricity cost more. Still, for convenience they were prepared to pay the higher price.

The Lighting Load.

Since the war, however, we have charged a flat rate of 5s. 5d. per 1000 c.ft., and 4s. 10d. per 1000 c.ft. for large consumers. The conditions which prevailed at the time of the introduction of cookers have entirely altered. In fact, the lighting load is now the problem, and to encourage this load we give free maintenance, sometimes charging at cost price for materials used. We have equipped shops for gas lighting on the distinct understanding that the consumers were under no obligation to keep the fittings if they were not satisfied. I am pleased to say that no fittings have been returned to us where we have adopted this arrangement. We have always emphasized the fact that the heat generated by the gas lighting burner keeps the shop warm and the stock in good condition, whereas in electrically lighted shops other means have to be adopted to keep them warm, and in many cases the gas used for heating under those circumstances costs more than if the shops were lighted by gas.

We at Carlow were also among the first to adopt slot meters and free installations, which, in our case, included a cooker and two lights. We now fix any number of lights, for, obviously, if it pays to fix two lights, four or five would pay better if used. The average consumption per slot meter is a little over 20,000 c.ft. per annum.

Problem of Old Cookers.

We are now in the unfortunate position, described by your President in his address last year, of having large numbers of old slot cookers in use. The consumers appear to think that they have nothing to do but to ask for a new one. A great deal of tact has to be used in these circumstances, as we could not possibly afford to give new cookers to them all.

With regard to gas fires, we do not let these out on hire, the reason being that we do not think it would be a paying proposition, for in a short time new fires would be asked for and something more than tact would be required to deal with the situation. Our arrangement is to charge only cost price and to

fix the fires free of charge. If necessary, we accept payment by instalments. We advertise gas fires in the autumn and winter, and cookers generally in the spring and summer.

Unfortunately, gas is dear in Ireland owing to the distance from the coalfields and the fact that the average gas-works are small. In consequence, the consumption per meter is small. To meet this position, new methods of charging will have to be adopted. There are three methods at least that are worthy of consideration.

New Methods of Charging.

The first method is that of giving a reduction in price for all gas used in excess of existing consumptions. This method has been in operation for a long time in Ireland and has justified itself. It is, however, open to objection, because those who are already good consumers are penalized in having to pay the present charges for a large amount of gas before the reduction takes effect, while the small consumer gets the benefit at once.

The second method is to make the charge on the valuation basis. This method has been in operation for some time at Donaghadee and has more than justified itself. However, since a hue and cry has been raised by the people owing to the Shannon Electricity Board adopting this principle, it may be better to consider other means, at any rate in the Free State.

The third method has been in operation, I believe, in Halifax for some time, and is what might be called the quota system. The idea of this principle is to take the average consumption for similar houses or, if preferred, the valuation may be taken as a basis. After the quota has been reached, a substantial reduction is given for any further gas used. As a starting point, I would suggest that where the ordinary price of gas is 7s. 6d. per 1000 c.ft., the price to be charged for all gas consumed after the quota has been reached should be not more than 5s. per 1000 c.ft. Where the price of gas is 5s. per 1000 c.ft., the price above the quota should be 2s. 6d., and all other prices should be *pro rata*. A reduction of a few pence would have little or no effect in increasing the consumption.

Making New Methods Pay.

Some members may ask how such a method would pay. The answer is quite simple. In the vast majority of small undertakings, if not all of them, from 50 to 100 p.ct. more gas could be made with the existing staff. Other charges would remain more or less stationary, the only increase being in the cost of coal, less residuals, and as some small works have a large leakage account, the extra consumption would at least make the percentage of unaccounted-for gas less than it is at present.

In conclusion, I would emphasize the importance of courtesy in dealing with the public. If complaints are made, they should be attended to at once. Where a bad light or any other defect is observed, it should be attended to at once, without waiting for a complaint to be made. It is also essential that the gas should be maintained at a good quality and pressure.

COMBINED DISCUSSION.

Mr. F. J. Edmonds (Waterford) said there were one or two points in Mr. Young's paper which particularly appealed to him. The first was with regard to his reference to the series of "ups and downs—mostly downs." He thought that at the present time the author should be thinking a little more of the upward tendency, because he saw that his Company were paying a 10 p.ct. dividend. They were on the upward grade, and this in spite of the fact that Carlow was the first place in the Irish Free State to have electric competition, which they had faced now for many years. How many meters per consumer did he have pre-war, with three rates of charge? Did he have three meters, or did he come to some arrangement with the consumers as to the amount used for different purposes?

Convenience of Gas.

He did not altogether agree that electricity had at the present time much of a pull over the gas industry in the matter of convenience. Gas could be utilized as conveniently as electricity. According to report, a switch was coming out which would not require a by-pass, and this would bestow upon gas a further great advantage. While appreciating the benefits of slot consumption, he did not think one should go quite to the extent of giving four or five lights. Mr. Young said four or five lights would pay, if used; but they might take it for granted that this number would not be used in the same proportion that two lights would be. Therefore, the extent to which smaller undertakings would probably feel inclined to go was two lights and a cooker. Mr. Young referred to gas being dear in Ireland, owing to the distance from the coalfields, and to the fact that the average gas-works was small; but if they looked up statistics of 20 million c.ft. undertakings on the other side, he did not think they would find many selling gas as cheaply as in Ireland. The price at Carlow compared very well with undertakings of the same size in England. As to methods of selling gas, he was in favour of a service charge. It was the very best basis of all.

Go to the Authorities.

Mr. A. Law (Limerick) remarked that many people seemed to be afraid of the power of the Government. He believed in going to the authorities and asking for what one wanted. In doing so, he had been treated with every consideration, and had got what he desired. He would urge them not to talk so much about State-aided electricity. The State were also out to aid gas, because they recognized that gas possessed as many good points as electricity. The sooner they got rid of the bugbear of State-aided electrical competition, the better it would be. They should force any such idea out of their minds, and go to the Government and ask for what they wanted—putting their case forward clearly.

Lighting Points for Slot Consumers.

Mr. G. Walmsley (Londonderry) found himself in disagreement with Mr. Edmonds as to the number of lighting points which should be provided for slot meter consumers. Personally, he thought it was a good idea to offer five or six lighting points, instead of two as formerly. In what were termed free-wiring schemes, their competitors offered to wire the house throughout. Lights in rooms used intermittently were very useful, although not much of a revenue producing proposition in themselves. If they could offer to light up a house throughout, as the electrical people did, they would stand a much better chance of retaining existing consumers. It might be a mere coincidence, but he noticed that Mr. Young's average consumption per slot meter user was 20,000 c.ft. per annum, while Mr. McIntyre's figure was 10,700 c.ft. He would not go so far as to say that in Mr. Young's case the supplying of lights throughout the house would cause the average consumption to be doubled, but he really thought it must have helped matters. There was, too, this in it. They had already incurred the capital expenditure on the service and meter, and the partial piping of the house, so that the additional cost of these extra lights would not be very serious. From this point alone, it would be advisable to give the gas consumer all the advantages which their competitors were evidently prepared to offer. The small increase in consumption would more than compensate for the extra capital expenditure. No doubt, the first thing to do in order to meet electrical competition was to bring down the price of gas to as low a figure as possible in comparison with the existing price. Evidently Mr. McIntyre's system of mixing producer gas, which was admittedly very cheaply produced, with the gas from the existing system had enabled him to do that. After all, the principal basis of competition was cost.

No Such Thing as Free Wiring.

Mr. T. J. Reid (Ballina) said that for some years their Secretary had found increasing difficulty in getting ordinary members to read papers, the underlying reason being that they felt that if they could not produce papers scintillating with graphs, diagrams, plans, figures, and statistics to five places of decimals, it was no use bringing subjects forward. As one of those who were, perhaps, instrumental in helping to destroy that idea by persuading the present authors to contribute the interesting and valuable papers they had heard that day, he felt the Association were to be congratulated; and he hoped there would be a continuance of such contributions. They were exceedingly useful to their Association, consisting principally of representatives of small works. He was convinced that from among their own members they could produce papers which would be of greater value to them than others of a more pretentious type. It might be that Mr. McIntyre's paper dealt with routine work, but if it was merely routine work that had enabled a small town of 3800 inhabitants to show an output of 18 million c.ft., the sooner the Association turned attention to routine matters the better it would be. He had been so interested in what had been done at Dungannon that he had paid a visit to Mr. McIntyre's works. He wanted to find out if there was anything peculiar to Dungannon that was not common to other towns of similar size in Ireland, and he could find nothing. He had, therefore, come to the conclusion that what was done there could be done in other towns of similar size in Ireland, and this was a very comforting thought. If they adopted the same methods, and attained the same ends, they would be supplying as much gas per inhabitant as possible, which was the chief aim of gas-works. These methods were not revolutionary, but they had enabled Mr. McIntyre to turn out more gas per head than any other town of that size in Ireland. If others accomplished what the author had, they would be doing all that could be done to put gas in the best possible position.

Mr. Young's paper was also very instructive, and dealt with another aspect of gas business. He had been up against electrical competition for forty years, and therefore the new position that many gas managers had to face to-day was no great matter for him. He was well aware of how to meet it. In this connection, he (the speaker) did not like the word "fighting." There should be no necessity for this, because gas and electricity had both their several spheres of use. It was only in the matter of directing and guiding the public that he found fault with those who were sponsors to the Shannon scheme. They did not guide people to find out the best uses for both electricity and gas, but used methods which were not, perhaps, to the benefit of the community. The State should use its powers for the good of the community as a whole, and not to bolster-up one industry as against another. Reference had been made by Mr. Walmsley to free wiring for electricity, but was there any free-wiring scheme in the Irish Free State? It was all hire-purchase, so that every person who had his house wired for electricity had to pay for it. Therefore, he did not think the idea should go forth that there was such a thing as free wiring. After all, the gas industry were doing far more. They were putting in absolutely free installations in many cases, without charging in any shape or form. These were ordinary papers, and it was in the ordinary way of work that their salvation would lie. Dungannon had not adopted any extreme ideas with regard to differential prices. If these fair, square, and above-board methods had succeeded at Dungannon, why should they not succeed elsewhere? [Applause.]

Mr. W. Reid (Athlone) said he found that now people were quite in favour of 1d. per unit, and an overhead charge, though there was an outcry against the system at first. How did those people who had a two-part tariff deal with slot meters? In his experience, the slot consumer was a poor consumer, from whom it would be very hard to collect a periodical service charge. The new type of

cooker with the regulator was an excellent way of securing consumers. The great drawback was that they had not the money to get the cookers out quickly enough.

A Meter Suggestion.

Mr. W. H. Roberts (Donaghadee) said he had been working the two-part system for two or three years with success. The slot meter was one of the difficulties, and he had asked a number of meter manufacturers if they could provide a meter that could be turned to zero every year. After the consumer had paid for a given quantity of gas the meter should automatically switch over into a sort of second gear, and supply gas at (say) half the price—say, 6s. 8d. per 1000 c.ft. for the first 14,000 c.ft., then switch over to 3s. 4d. for the rest of the year. This would be superior to charging a quarterly rate. As to electricity companies charging 1d. per unit, *plus* a fixed rate, in effect they were charging 6d. per unit for lighting and encroaching on the heating and cooking load at 1d.; but their actual average was anything from 3d. to 4d. per unit. As a counter-attack he would venture to cut down the price of gas to as low as 1s. per 1000 c.ft. on the rateable value basis, which he hoped to do in the near future. Unless the consumer was going to drop gas lighting at 1s. per 1000 c.ft. and take up electric lighting at 6d. per unit the other side would have to drop their dual scheme, because they would not get the 6d. to help them to sell cheaper for cooking and heating. He could not understand why the National Gas Council and the British Commercial Gas Association would not publish to the world the actual facts of gas *v.* electricity for lighting. They seemed to think there was something they did not dare to do in this matter. This was one of the points he was anxious to see fought out.

Mr. J. O. Halliwell (Mullingar) adduced a number of figures to show that certain local authorities were minded to adopt electricity in place of gas for public lighting, regardless of the fact that the cost would be considerably greater.

Mr. Reid agreed that people seemed to be prepared to pay a greater price for electricity, and to adopt it to a larger extent than they would gas lamps.

A Question of Policy.

Mr. J. C. Walker pointed out that the British Commercial Gas Association had done a great deal in the way of issuing publicity material—first presenting a positive case with regard to gas for lighting, and secondly in the form of leaflets giving comparisons of gas with electricity for lighting, both domestically and for streets, shops, and so forth. Rightly or wrongly, the Executive did not consider that they would accomplish much by controversial publicity in the national Press on the question of the relative merits of gas and electricity. Policy was a matter for the Executive Committee, and not for the officials, but frankly he agreed with the Executive Committee. From the point of view of what any member might wish to do in his own district, he could only say that the "B.C.G.A." had provided all the material that any national organization could reasonably be expected to provide.

Mr. J. A. Pemberton (Sligo) declared that the electricity people would find it very hard to get a living where a go-ahead gas company were running their business energetically. They must use every endeavour to reduce their manufacturing costs to a minimum, and they must educate people on the relative costs and advantages of gas.

Mr. T. D. Hamilton (Belfast) said that in a district with which he was connected a substantial consumption was lost when a factory went over to suction gas. He installed a Tully plant and found it an economic proposition to sell the gas at 2s. 3d. per 1000 c.ft., with the result that the factory returned to the gas undertaking for its supplies. He did not use any extra coke, and their standing charges were the same. This should be an encouragement. He did not think they should throw up their hands when confronted with suction gas engines; but they could not compete if they supplied 500 B.Th.U. gas. Their make now was 19,500 c.ft. of 420 B.Th.U. gas. He was the first man in Ireland to install a modern Tully plant. The price to ordinary consumers had been reduced from 6s. 10d. to 6s. per 1000 c.ft. Such troubles as he anticipated had never occurred.

Mr. C. W. Surman (Ballymena) said he had established a power rate ranging from 4s. 6d. to 2s. per 1000 c.ft., according to consumption. The cost of gas into the holder worked out at 1s. 8d. per 1000 c.ft. The overhead charges would be no more by supplying the extra gas for power purposes, and if they were selling gas at 2s. per 1000 c.ft. there would be a profit roughly of 2d. to 3d. per 1000 c.ft., which was well worth catering for.

Mr. Young said they had separate meters for cooking, lighting, and power. With regard to putting in four or five lights for slot consumers, his idea was that people would use them reasonably. The rateable value service charge had given rise to great objection in Carlow, and there were people who were going back to gas on account of it.

Mr. McIntyre also briefly replied to the discussion.

Composition of Benzole from Gas Manufactured in Vertical Retorts*

By W. A. Voss, of the Gas Light and Coke Company

(*Concluded from p.* 480.)

Fig. 2 shows the fractionation curves of the crude benzoles for extractions of 3 gallons and 1·5 gallons per ton of coal compared with the total benzole. The corresponding curves for the washed benzole are given in fig. 3. Fig. 4 shows the complete fractionation of the total crude benzole in the gas.

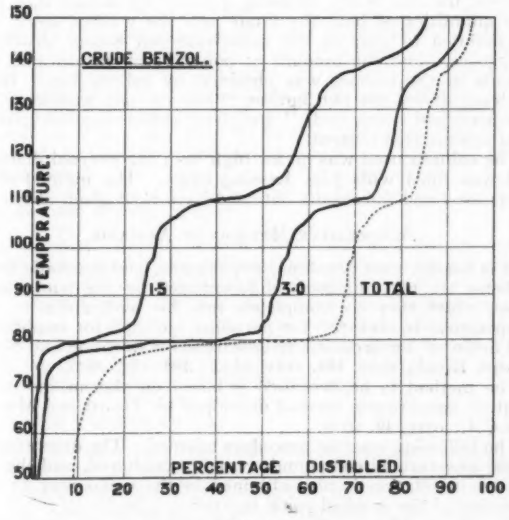


Fig. 2.

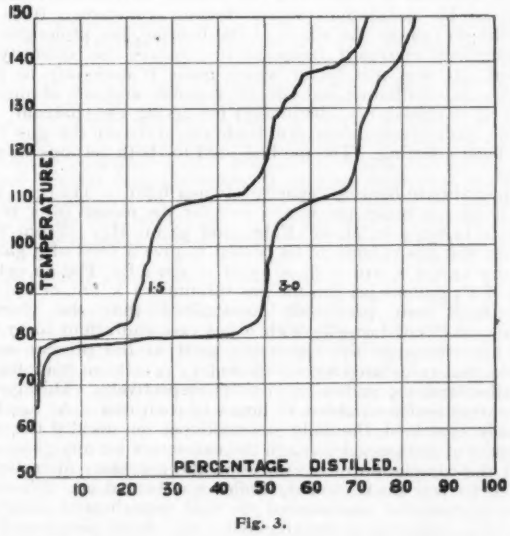


Fig. 3.

It was realized that the high paraffin content of the benzole might affect the accuracy of the analyses. Spielman and Jones, dealing with the analysis of benzole forerunnings (J.S.C.I., 1916, **35**, 911) and referring to the high paraffin content of that fraction, state that the results will be less accurate, but that there will be no serious deviation from the true values. From the nature of the method of analysis any inaccuracy would be confined to the relative proportions of paraffins, benzene, toluene, and xylenes. In order to determine the extent of this inaccuracy, if any, an alternative method of analysis has been evolved, and will be explained in detail at the end of this paper. Briefly, the method consists in (*a*) a direct analysis of the paraffin content by sulphonation of the aromatics and removal of the carbon disulphide, and in (*b*) a reduction of the paraffin content to a normal amount by a separation of the paraffins

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and aromatic compounds with dry aniline. As a result of this it was found that direct sulphonation gave a paraffin figure 1-2 p.ct. lower than the normal method of analysis, and that the differences for the aromatic constituents were of the same order. It would therefore appear that the large amount of paraffins has not affected the accuracy of analyses to any serious extent. This is in agreement with the work of Colman and Yeoman (J.S.C.I., 1919 **38**, 68 T) with a prepared benzole of high paraffin content.

Experimental Data.

Each extraction filter contained 300 grammes of undried active charcoal, and the liquid used in the boilers for heating the charcoal was tetrachloroethane (b.p. 144°), which has the advantage of non-inflammability.

A series of standardized preliminary runs was made before the collection of samples. There were two reasons for this. First, it was necessary to determine the benzole capacity of the filters in order to arrive at the approximate volumes of gas to be passed. Secondly, it ensured that the quality and quantity

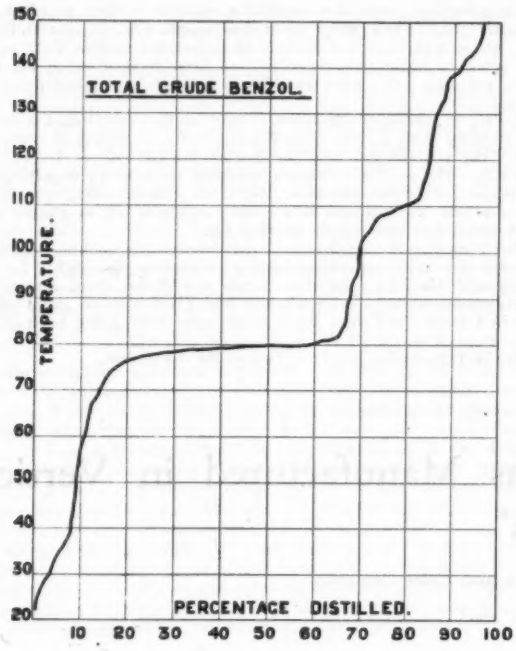


Fig. 4.

of the retained benzole—*i.e.*, the benzole unremoved from the charcoal by distillation—would become constant. It is not possible to remove the whole of the benzole, but prolonged distillation—or increased temperature—reduces the quantity retained. It was this factor which made it necessary to standardize the distillation and also the quantity and rate of nitrogen used at the finish of a distillation for drying the charcoal.

The data given below are from the tests on the gas from the Type 1 setting. The method used for both settings was the same.

Approximate benzole capacity of each filter = 110 cc. Average daily gas make per ton of coal for the month prior to the test = 14,833 c.ft. at 60° Fahr. and 30 in. Hg. From these figures the gas volume to be passed to give a yield of 3 gallons per ton 14,833 × 110 ÷ (3 × 4536) = 120 c.ft. For an extraction of 1·5 gallons per ton the gas volume is 2 × 120, or 240 c.ft.

It had been previously ascertained that the charcoal "stripped" satisfactorily with a gas rate equivalent to 17 c.ft. per hour through the extractors used in the present work. The actual rates used were 6·66 and 13·33 c.ft. an hour for the 3 gallon and 1·5 gallon extractions respectively. This gave a saturation period of about 18 hours in each case. As has been already explained, the daily gas make per ton decided the exact volumes of gas passed through the extractors for any given run.

At the completion of a saturation the necessary alteration to the cocks was made, and the boiler was heated up. When the tetrachloroethane commenced to boil superheated steam at 160° was admitted to the charcoal. The distillation lasted one hour, and the steam rate was such that at the end of this period 600 cc. of water were collected in the receiver in addition to the benzole recovered. The receiver was in the form of a glass separating funnel. The benzole was separated and measured, and, except in one or two cases where the yield deviated by more than 0·1 gallon per ton from the required figure, it was retained. At the completion of the distillation 4 c.ft. of nitrogen were passed through the charcoal bed during 30 minutes.

The following table is typical of the results obtained.

Run No.	Gas Volume. C.Ft.		Gas Make per Ton of Coal.	Benzole Yield. CC.	Benzole per Ton of Coal. Gallons.
	Actual.	Corrected.			
10	125·3	120·8	14,810	110·0	2·974
11	124·6	120·2	14,750	109·5	2·693
12	121·3	116·6	14,880	110·0	3·094
13	124·4	121·3	14,880	112·0	3·030
14	126·4	123·1	15,220	111·0	3·026
15	124·7	120·8	14,930	107·5	2·931
16	121·9	119·0	14,630	110·0	2·982
17	128·4	125·1	15,780	97·0*	(2·698)
18	119·2	117·0	15,770	104·5	3·103
19	120·3	118·5	15,590	107·0	3·102
20	120·3	118·4	15,730	104·0	3·045
21	119·1	116·4	15,090	105·0	3·000
22	122·0	119·0	15,410	106·0	3·041
23	123·0	120·9	15,370	112·0*	(3·139)
24	125·3	124·2	15,580	111·5	3·082
25	128·5	126·9	15,430	108·0	2·896
26	127·6	125·7	15,540	106·5	2·903
27	129·1	126·0	15,800	106·0	2·939
28	125·6	123·3	15,610	104·5	2·917
29	127·0	124·7	16,000	105·5	2·985
30	125·9	123·3	15,830	104·5	2·958
31	122·3	119·6	15,350	106·0	2·998
32	118·5	115·3	15,240	105·0	3·066
33	126·4	123·7	15,760	105·0	2·949
34	124·0	122·2	15,840	108·5	3·101
35	125·1	124·8	16,040	106·0	3·003

Average of sample analyzed was 3·00.

* Discarded.

At the completion of the extractions the combined samples from a filter were analyzed in each case.

A preliminary washing with sulphuric acid indicated the presence of a relatively high percentage of unsaturated compounds. It was accordingly decided to wash all the samples under the same standardized conditions used by the author for the comparison of the benzole obtained from carburetted water gas with that from horizontal water gas (J.S.C.I., 1927, **46**, 373 T). Briefly, this consists in shaking a given volume of the crude spirit, under carefully controlled conditions, with 10 p.ct. of its volume of 80 p.ct. acid for 3 minutes, followed by 6 minutes' shaking with 10 p.ct. of 95 p.ct. acid. The use of these standardized conditions gives a satisfactory washed spirit, and makes comparison possible between benzole obtained by different methods. As has been stated, the loss on acid washing the benzole from vertical retort gas was heavy, and it became evident that, with a large quantity of unsaturated compounds present, the amount which polymerized and remained in the washed benzole would be appreciable. It is, in fact, of the order of 10 p.ct. on the original crude benzole. To return the loss on acid washing as the percentage of unsaturated compounds would not only give an incorrect amount, but would also give a misleading figure for the washed spirit residue. For example, in the case of one sample examined the residue boiling above 150° was 13 p.ct. of the original crude. Actually, of this 13 p.ct., no less than 9 p.ct. consisted of polymerized unsaturated compounds, the true heavy oil being 4 p.ct. To obviate this, separate quantities of both the crude and the washed spirit were fractionated to 150° at the same rate—an 8-hour distillation on 750 cc.—and the amount of polymerized unsaturated compounds in the residue was obtained by subtraction. In the analyses shown the two figures, "loss on acid washing" and "polymerized compounds," are given, which together give the total unsaturated content.

The column used was 30 in. high by 1 in. internal diameter, and was filled with ¼-in. Lessing rings. The method of analysis used and the results obtained have been given above.

Alternative Method of Analysis.

It is known that paraffins, naphthenes, and aromatic hydrocarbons are very distinctly differentiated by the temperatures above which they are completely miscible with aniline. This temperature is over 70° for paraffins, 30°-35° for naphthenes, and below 0° for aromatic hydrocarbons (Chavanne and Simon, Compt. Rend., 1919, **168**, 1111, 1324; **169**, 185, 285).

The method to be described is based on the aniline critical solution temperature method developed by Tizard and Marshall (J.S.C.I., 1921, **40**, 20 T).

The following was the procedure adopted. The determination of the unsaturated compounds remains unaltered, and the residue on distillation is also obtained in the usual way by fractionation of the washed spirit to 150°.

Paraffins.—The paraffins are determined in 250 cc. of crude spirit by shaping with twice this volume or 105 p.ct.* oleum in two batches, after a normal acid wash to remove the unsaturated compounds. After setting the oil was water-washed, dried, and treated with alcoholic potash to remove carbon disulphide. After a further water wash the paraffins are dried over calcium chloride and measured. The volume of the oil remaining with the calcium chloride is obtained by the addition

* *Cf.* R. Heilingötter, Chem.-Ztg., 1929, **53**, 79.

of water when the volume may be read off from the top of the solution.

Benzene, Toluene, and Xylene.—A sample of the benzole which has been washed in the usual way and well dried is mixed with one or more volumes of dry liquid paraffin (" white oil," flash point 200°) in order to give a high paraffin content. The mixture is then shaken with freshly-distilled dry aniline and the aniline-aromatic, hydrocarbon layer separated after settling. The relative volumes of aromatics, paraffins, and aniline are important in obtaining a satisfactory separation, as is also the temperature at which the operation is conducted. The benzole is recovered from the aniline by fractionation,

Benzole from Vertical Retort Gas.

Unsaturated compounds—
(*a*) Acid loss . . . . . 20·4
(*b*) Polymerized . . . . . 11·8 } 32·20 p.ct.

—	Normal Method.	Alternative Method.
	P.Ct.	P.Ct.
Carbon disulphide	0·39	(0·30)
Paraffins to 150°	20·38	19·00
Benzene	31·78	34·31
Toluene	9·69	8·88
Xylenes to 150°	4·28	4·03
Residue	1·28	1·28
	100·00	100·00

washed with dilute hydrochloric acid to remove any possible traces of aniline, and analyzed in the normal way. The method is tedious and cumbersome, and was used merely as a check on the normal method. The two sets of results are compared below. The carbon disulphide figure obtained by the alternative method is low, since this substance reacts with dry aniline.

Conclusions.

The benzole in the gas obtained from continuously-operated vertical retorts carbonizing Yorkshire coal is characterized by high unsaturated hydrocarbon and paraffin contents. The unsaturated compounds would probably complicate washing on a large scale, and the acid cost relative to the quantity of useful spirit obtained would be greater than is the case with benzole derived from horizontal retorts.

The specific gravity of the benzole approximates to 0·845. This low gravity is due to the large quantity of paraffins, and would make compliance with the existing benzole specification difficult. There is no reason to suppose, however, that the spirit would be inferior as a motor fuel to benzole from horizontal retorts.

The work described was carried out in works of the Gas Light and Coke Company, and forms part of a general investigation on the relationship between manufacturing conditions and the quality of the benzole in the gas.

The author desires to express his thanks to Mr. L. A. Ravald for assistance received with the confirmatory tests described above.

IN THE EARLY 'FIFTIES.

Being Glimpses into the Files of the "JOURNAL."

What About the Stokers?

This is from our advertisement columns: The Directors of the Wrexham Gas and Coke Company are in want of a Working Manager for their works. He must be fully competent to undertake the manufacture of gas; and a preference will be given to a person who understands the fittings business. He will have to employ his own stokers. Salary, £150 per annum, and the use of the house on the works, coals, and gaslight.

Who Would Not be a Gas Manager?

At a time when the Huntingdon Gas-Works are asking for a manager without a large family, and the Newbury Gas Company are desirous of employing a man " who thoroughly understands his business," the Torquay Gas Company advertise for a man competent to undertake the entire management of the works. He " will be required to collect the gas rents, keep the accounts, &c., &c., and to devote his whole time to the service of the Company, and to find security. The salary will be £100 a year."

How are the Mighty Fallen!

An accident, happily unattended with any serious consequences, happened lately to Mr. Croll, while making a survey of the Gosport Gas-Works. The opening into a tar tank having been left exposed, the surface of the tar became covered with a coat of lime and dust, so as to render it indistinguishable from *terra firma*. An incautious step immersed Mr. Croll in the tar tank, from which, however, he was speedily rescued by those who accompanied him in his survey.

Large-Scale Cooking by Gas.

This is an account of the festivities at Pontypool consequent on the birth of an heir to the extensive estates of Capel Hanbury Leigh, Esq., the Lord Lieutenant of the County of Monmouth: The roasting of the ox, which used in the olden times to be a gross and often disgusting exhibition, was rendered by the aid of science a matter of deep interest. It was resolved to cook it by gas; and, under the personal superintendence of Mr. Vickery, Gas Engineer, of Exeter, and Mr. Price, Gas Manager, of Pontypool, the operation was effected in the following manner: A cylinder, composed of iron plates of sufficient dimensions to receive the carcass of the ox, which weighed when dead 1372 lbs., was fixed and encased in a stack of fireproof bricks, and upon the inside of it were introduced circles of gas pipes having numerous perforations. The ox was then suspended from a triangular erection, and the operation of roasting was commenced, and in about eight hours was brought to a very successful conclusion. It was found that the heat generated by the gas could be raised to 600 degrees of Fahrenheit, but it was kept at from 240 to 300 degrees. The roasting yielded 140 lbs. of clear dripping, which, it was calculated, would realize a sufficient sum to cover all the cost of erecting the apparatus, the 5000 c.ft. of gas consumed, &c.

Supplying Gas to a " Colossal Structure."

Three competitors are in the field for the supply of gas to the Crystal Palace—the colossal structure now approaching completion. The Sydenham Gas Company are already in possession of the ground, and furnishing the best supply their means allow. The South Metropolitan Company are laying a mile-and-a-half of 9-in. main pipe, with the view of offering a plentiful supply of their excellent gas to the inhabitants of the rapidly increasing neighbourhood; and a new Company, the Crystal Palace District Gas Company, is making strenuous exertions by advertisements to find shareholders willing to subscribe £50,000 for the speculation. Among such rivalry the public cannot fail to make advantageous terms for its supply of gas.

A Gas Ignited Coke Fire.

The " Journal of the Society of Arts " says that Mr. Davenport, one of the officers of the Society, has adopted a method somewhat simiar to that proposed by Mr. Jeffreys for the fires of bedrooms, which are required to be lighted on short notice, and to burn without smoking. Mr. Davenport connects a hollow gas ring with the gas pipes near the chimney, by means of a flexible tube of the usual kind. This hollow ring is entered between the two lower bars of the front grate, is perforated on the upper side with small holes, and the fireplace is filled with coke above the ring, which lies upon the bottom grate. The jets of gas issuing from the holes in the hollow ring ignite the coke above, and soon produce a clear and smokeless fire.

The Emperor is Delighted.

A portion of the capital of the Brazils (Rio de Janeiro) has been recently lighted with gas, to the evident delight of its inhabitants, who thronged the streets until midnight. The Emperor himself walked leisurely up one of the principal streets expressing, his admiration. Many Europens accustomed to gaslight were struck with the peculiar brilliancy of the gas.

REGISTER OF PATENTS

Operation of Chamber Ovens.—No. 318,935.

DR. C. OTTO & COMP. G.M.B.H., of Bochum.

No. 27,766; Sept. 12, 1929. Convention date, Sept. 12, 1928.

This invention relates to the working of chamber ovens for the production of gas and coke at different carbonizing periods. The patentees point out that, particularly in gas-works, in consequence of the fluctuating consumption of gas, the production must be correspondingly varied within wide limits. In the old retort ovens this was usually met by separate groups of ovens being put out of action when the required production was small. This method is impossible, however, for the new chamber ovens which are built of silica bricks, since it is known that silica bricks are considerably affected by wide changes of temperature and, in consequence of their contraction under these conditions, give rise to leakages in the brickwork. The invention enables chamber oven installations built of silica bricks for the production of gas and coke to work at different carbonizing periods without putting any of the groups of the installation out of operation.

The chamber ovens are arranged in groups, an adjustable closing device for each group being provided in the common gas supply and also in the common air supply, by which each group can be worked at different carbonizing periods. Separate closing devices are also, preferably, provided in the waste-heat passages leading to the chimney. By this means, the ovens of the battery are worked, according to the gas consumption at any time, all with a long, or some with a short and some with a long, carbonizing period. Each group may consist, according to the number of the ovens, of, for example, ten or twelve ovens. The combustion fuel, gas, and air is led through supply pipes under a regulated pressure. When the production is to be increased, the groups nearest the chimney receive in succession, by opening the closing devices, a greater quantity of combustion fuel than the more distant groups.

Water Gas Generators.—No. 333,072.

HUMPHREYS & GLASGOW, LTD., of 38, Victoria Street, Westminster (Assignees of C. S. CHRISMAN, of Philadelphia).

No. 27,134; Sept. 6, 1929. Convention date, Oct. 18, 1928.

The general object of this invention is to provide improved means for removing the ash and clinker from the fuel bed and the generator mechanically—in other words, to provide an improved mechanical grate and ash disposal equipment. It particularly provides a means of mechanical ash removal which may be placed in existing gas generators without decreasing the height of the fuel bed or raising the height of the operating floor, and avoiding the necessity of a stoking platform. When placed in existing generators it also does not increase the over-all outside diameter of the generator.

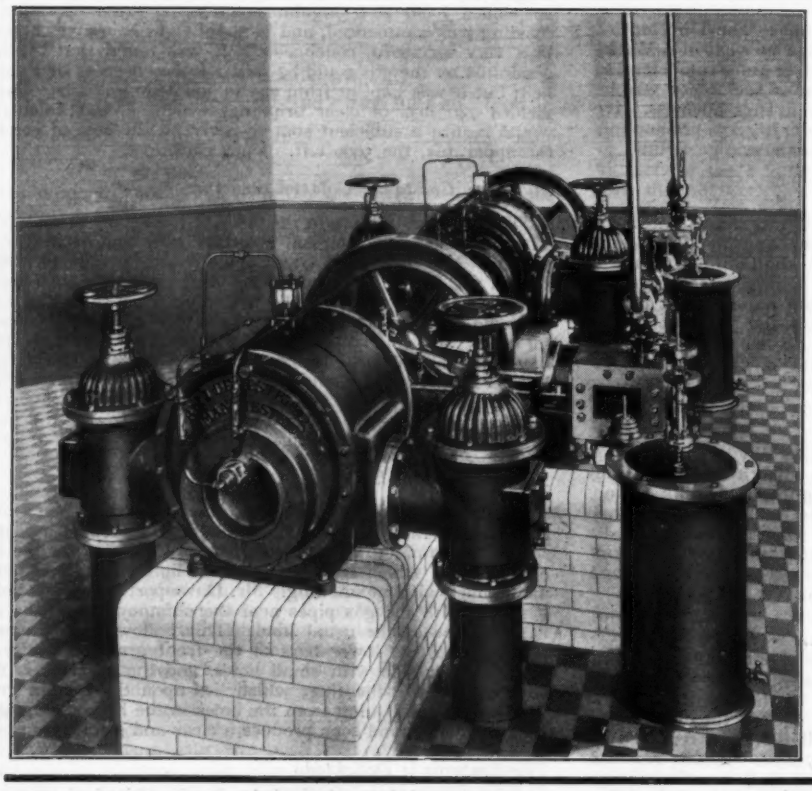
Stated generally, the invention comprises a gas generator of the kind in which the fuel bed is supported by a rotatable bosh of approximately inverted conical shape, with a central opening through which the ash is expelled, and provided with ribs or bars adapted to force fuel downwardly towards the ash outlet, wherein a perforated tuyère is located within the central opening so as to provide an annular space between it and the rotatable bosh. This tuyère is provided with ribs or bars, which may be curved preferably in the same direction as those on the bosh. The invention also provides means for crushing clinker being discharged through the space, and for the removal of the ash from the generator bottom after its discharge from the fuel bed.

Producers.—No. 332,921.

SOUTH METROPOLITAN GAS COMPANY and CARPENTER, C. C., both of 709, Old Kent Road, S.E. 15.

No. 13,421; April 30, 1929.

This invention consists in substituting for the natural-draught through the producer, during the clinkering period, a controlled suction by which the draught may be kept above the minimum requisite for avoiding dangerous escape of hot gas through the clinkering doors. This minimum, state the patentees, is generally much below the draught employed in normal working, and in consequence the fuel bed cools considerably during the clinkering period if no more than this minimum draught is maintained. By the present invention, it is claimed, a suction device maintains throughout the clinkering period the full normal draught, with the result that the temperature of the fuel bed is reduced but little, and good quality gas is made both during the clinkering period and immediately the producer is put back on normal work after the completion of clinkering. Moreover, it is possible to return the producer gas made during the clinkering period to the producer gas delivery main, with the result that the volume of gas available in the delivery main



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R. & J. DEMPSTER, LTD., MANCHESTER.

LONDON OFFICE: 34, VICTORIA STREET, WESTMINSTER, S.W.1.

is not affected by the operation of clinkering, and the loss of fuel during clinkering is prevented.

Since suction fans or the like which will withstand the temperature of the producer gas are costly, it is preferable to use a producer of the kind in which the offtake is at such a level that there is a bed of green fuel above it, and to apply the suction above this bed. In this manner the temperature of the gas is reduced before it enters the fan, and at the same time the fuel is preheated. Herein there is another advantage—namely, that tarry matter as well as the moisture in the fuel is removed in the gas drawn through the fan, so that the producer gas subsequently made is so much the poorer in this matter. If the gas delivered by the fan is to enter the producer gas main, it may first be scrubbed to remove the tar and cooled to remove the moisture. In this connection it may be of advantage to operate the suction fan not only during the clinkering period but more or less continuously, so that there may be a proportion of the hot producer gas passing through the green fuel.

The invention comprises the combination of a gas producer with a suction device adapted to withdraw gas so that the latter must pass through the green fuel which is on its way to the fuel bed, this device being preferably in a by-pass to the valve which cuts off the producer from the producer gas main.

Gasification.—No. 333,021.

HIDAKA, H., of Yokohama.

No. 20,556; July 4, 1929.

The following claims are made for this invention:

1. A water gas generator for use with bituminous materials comprising a revolving coke extraction tube projecting inwardly at or about the centre of the bottom of the generator and adapted to remove part of the coke carbonized at a comparatively low temperature, whereby a quantity of coke is allowed to remain which, when gasified, yields a quantity of water gas suitable for the maintenance of a definite desired calorific value of the resulting mixed gas comprising the said water gas and the distillation gas produced in the carbonizing zone.

2. A water gas generator as claimed in claim 1 in which the revolving coke extraction tube is internally of circular and externally of irregular cross-section, whereby revolving motion of the tube loosens the fuel-bed surrounding it.

3. A water gas generator as claimed in claims 1 or 2 in which the revolving coke extraction tube is adjustable in a longitudinal direction for the purpose of the removal of coke of a varying degree of carbonization.

4. A water gas generator as claimed in claims 1, 2, or 3, in which the air and steam required in the water gas process are conducted in the desired sequence to a space around the coke-extraction tube from which they penetrate the surrounding fuel.

5. A water gas generator as claimed in any of the preceding claims in which there is provided in the coke extraction tube a coke extracting screw of variable speed of revolution and height relative to the tube and generator body.

6. A water gas generator as claimed in claim 5 in which the coke-extracting screw possesses a hollow shaft adapted for the passage of steam.

7. A water gas generator as claimed in any of the preceding claims in which the blow gas is used for heating the steam boiler after a proportion thereof variable by by-pass has traversed the steam superheater, whereby any fall in temperature in the generator can be compensated by a corresponding increase in the degree of superheating of the steam employed.

Applications for Patents.

[Extracted from the "Official Journal" for Aug. 27.]

No. 24,619—25,271.

ALDRIDGE & RANKEN, LTD.—"Mechanical driving of oscillating troughs for screening, &c., materials." No. 25,141.

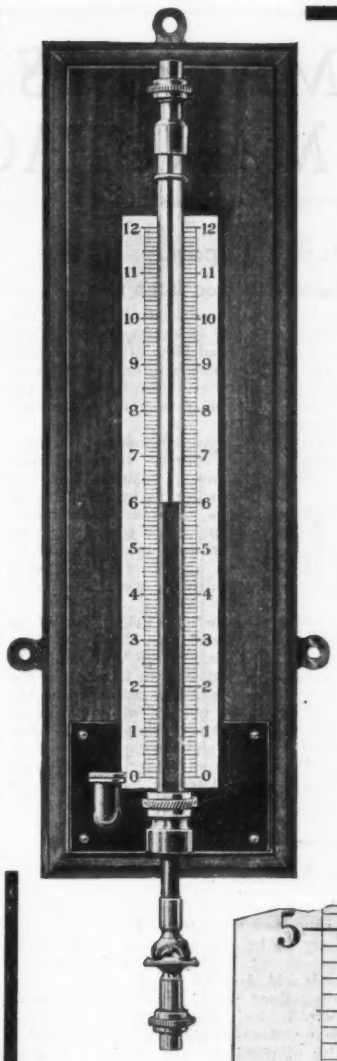
BROWN, W.—"Carbonizing plant." No. 24,864.

GOLDSPINK, G. E.—"Gas meters." No. 25,212.

SELAS AKT.-GES.—"Pressure gas burners for furnaces." No. 24,797.

WOLFF, F.—See Selas Akt.-Ges. No. 24,797.

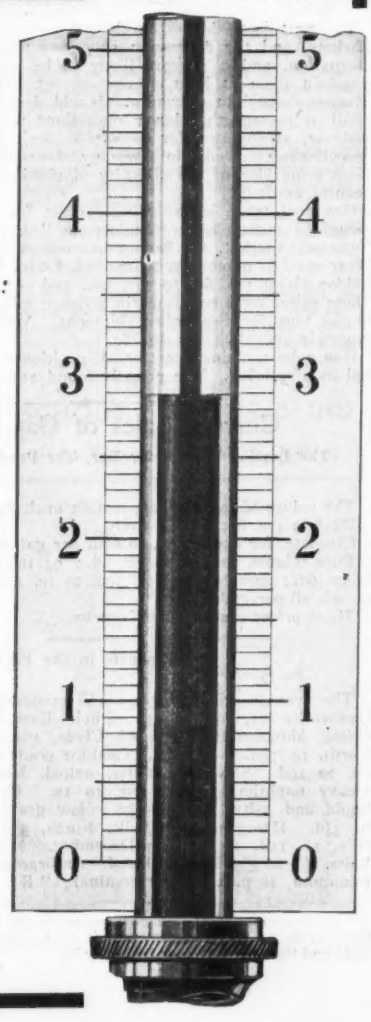
Potential buyers in the Gas Industry can be reached more surely and economically through the "GAS JOURNAL" than by any other means.



WRIGHT'S WESTMINSTER SINGLE TUBE GAUGE

ALL-BRITISH.

Below—Full-Size Scale and Tube.



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GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

An all-round cheerfulness prevailed on the Stock Exchange last week, and prices in most sections improved in consequence. While it would be imprudent to take an exaggerated view of the situation, for prices at the present time are likely to fluctuate on the slightest rumour whether political or industrial, there is a firm belief that the long period of selling has, temporarily at any rate, come to an end, and with it a return to brighter conditions.

The Gas Market, however, is little affected by any sudden "change-over" of this kind and maintains a steady course. In the absence of selling orders there was not a large volume of business done last week, but prices continue firm. The few changes in value, apart from the usual half-yearly *ex* div. markings, showed improvements —viz., European ordinary an increase of 3 points to 110, and South Metropolitan ordinary ½ to 102½. Debentures were again in demand. Gas Light 3 p.ct. and South Metropolitan 3 p.ct. each gained a point to 60½ and 59½ respectively, and Primitiva 4 p.ct. (1911) rose 2 points to 82½.

A notice appeared in the "London Gazette" on Friday last of an application by the Brighton and Hove General Gas Company for a Special Order for the transfer to the Company of the Worthing Gas Light and Coke Company. Provision is made for an increase in the capital of the Brighton Company by an amount representing the aggregate of the stocks to be issued to holders of consolidated ordinary or preference stocks of the Worthing Company, the premiums obtained by the Worthing Company, and the capital unissued. Holders of Worthing consolidated ordinary, preference, or debenture stocks will receive Brighton standard consolidated or "B" preference consolidated or perpetual debenture stocks of the Brighton Company, and powers are sought for the creation of these stocks.

Coal Markets.

The past week has again been practically featureless in all the markets, and the depression continues unabated. Prices show no fluctuation, and it appears likely to be the policy of the trade to maintain them at least at the current levels until the marketing schemes come into operation. World demand in all markets is so small at present that lower quotations would hardly attract more business, at any rate for early positions. Recent reports place the present stocks of coal in Germany alone at six million tons, which gives some idea of the difficulty of obtaining new business in continental markets.

Gas coal trade is exceedingly quiet for the time of year, and, though a rather better "undertone" has been observed on the Newcastle market, the feeling has not extended to the gas section. Wear specials quote 15s. to 15s. 5d. f.o.b., best qualities (Holmside, Boldon class) 14s. 6d. to 14s. 9d., and seconds 12s. 6d. to 13s. 3d. These prices were confirmed in a recent mixed sale to Paris of about 12,000 tons for September shipment. Yorkshire screened gas for export is quoted at 15s. to 16s.

Gas coke remains firm for all positions, stocks being reasonable and inquiry brisk. The price is round 21s. 6d.

Current Sales of Gas Products.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Sept.* 1.

The values of tar products remain unchanged, and are as follows:

Pitch is 47s. 6d. per ton f.o.b.

Creosote, for export, 6d. to 6¼d. per gallon f.o.b.

Pure toluole, 2s. 2d. to 2s. 3d.; 95/160 solvent naphtha, 1s. 5d. to 1s. 6d.; pure benzole, 1s. 10d. to 1s. 11d.; pyridine bases, about 3s. 9d. all per gallon.

These prices are *ex* sellers' works.

Tar Products in the Provinces.

Sept. 1.

The average prices of gas-works products during the week were: Gas-works tar, 20s. to 24s. Pitch—East Coast, 46s. f.o.b. West Coast, Manchester, Liverpool, Clyde, 46s. f.o.b.* Toluole, naked, North, 1s. 7¼d. to 1s. 8¼d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 3d. to 1s. 3½d. Heavy naphtha, North, 11d. to 1s. Creosote, in bulk, North, liquid and salty, 3¼d. to 3¾d.; low gravity, 1¼d.; Scotland, 3¼d. to 3¾d. Heavy oils, in bulk, North, 5½d. to 6d. Carbolic acid, 60's, 1s. 11d. to 2s. July/December. Naphthalene, £10 to £12. Salts, £3 to £5, bags included. Anthracene, "A" quality, 2½d. per minimum, 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Aug.* 30.

There is no change to report in market conditions in this area. Orders continue scarce and, as stocks are high, prices remain easy.

Pitch.—Inquiries are not plentiful. Nominal prices remain at 45s. to 47s. 6d. per ton f.o.b. Glasgow for export, and about 45s. per ton f.o.r. works for home trade.

Refined tar to Ministry of Transport Specification.—Few orders are passing, and value is unchanged at 3d. to 3½d. per gallon *ex* makers' works in buyers' packages.

Creosote.—There is a moderate demand for good grades. B.E.S.A. Specification is 2⅞d. to 3¼d. per gallon; low gravity, 3d. to 3¼d. per gallon; and neutral oil, 3d. to 3¼d. per gallon—all in bulk quantities f.o.r. works.

Cresylic remains quiet with prices easy. Pale 97/99 p.ct. is 1s. 7d. to 1s. 8d. per gallon; dark 97/99 p.ct., 1s. 6d. to 1s. 7d. per gallon; and pale 99/100 p.ct., 1s. 9d. to 1s. 10d. per gallon—all f.o.r. naked.

Crude naphtha is commanding 4¼d. to 4⅝d. per gallon *ex* makers' works.

Solvent naphtha.—Quotations are unchanged at 1s. 2½d. to 1s. 3¼d. per gallon for 90/160 and 1s. to 1s. 1d. per gallon for 90/190, both in bulk quantities.

Motor benzole continues steady at 1s. 5⅞d. to 1s. 6¼d. per gallon *ex* works.

Pyridines remain without interest. 90/160 is nominal at 3s. to 3s. 3d. per gallon.

Benzole Prices.

The following are considered to be the market prices at the present time:

	s. d.	s. d.	
Crude benzole	0 10	to 0 11	per gallon at works
Motor ,,	1 5½	,, 1 6½ ,, ,, ,,	
Pure ,,	1 10	,, 1 11 ,, ,, ,,	

Trade Notes.

Exeunt Paper and Wood Chips.

The practice of lighting a solid fuel fire with paper and wood chips is old-fashioned and wasteful. For the open hearth and for the hot-water boiler fired by coke, gas has come to stay as the means of ignition. For this purpose gas is most economical and it is obviously labour-saving. The gas firelighter makes a certainty of the solid fuel igniting, and the service is rendered at a fractional cost of a penny per fire. Messrs. William Edgar & Son, Ltd., of Hammersmith, make two types of gas firelighter. One, designed

A. D. B. C.

A. Polished Aluminium. B. Polished Aluminium. C. Seamless drawn steel tube. D. Polished Aluminium or Bakelite.

C. B. D. A.

A. Brass-finished steel bronze. B. Brass-finished steel bronze. C. Seamless drawn steel tube. D. Polished Aluminium or Bakelite.

The Two Types of Firelighter.

by the Gas Light and Coke Company, is a handsome article, and can be supplied with either a polished aluminium handle or one of red or green mottled bakelite. The other is a plainer article with a wooden handle and brass fittings finished in steel bronze. The blades for the two patterns of poker are interchangeable, and are constructed to fit between the bars of all coke boilers.

Contracts Advertised To-Day.

Handling and Screening Plant.

The Oldham Corporation invite tenders for coal handling and coke handling and screening plant. [Advert. on p. 540.]

Lamp Pillars.

The Lighting Sub-Committee of the City of Sheffield invite tenders for the supply of lamp pillars. [Advert. on p. 540.]

Main Extensions.

Tenders are invited by the Borough of Workington Gas Department for extensions to their mains. [Advert. on p. 540.]

Vertical Retorts.

The Oldham Corporation invite tenders in connection with an installation of vertical retorts. [Advert. on p. 540.]

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Aug. 29.	Rise or Fall on Week.	Transact'ns Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
171,978	Stk.	Aug. 14	5	5	Aldershot 5 p.c. max. C.	73—78	..	..
322,992	,,	,,	4	4	Do. 4 p.c. Pref.	68—71	..	..
1,551,868	,,	Apl. 3	7⅞	7⅞	Alliance & Dublin Ord.	92—95	..	..
374,000	,,	July 10	4	4	Do. 4 p.c. Deb.	60—63	..	..
522,655	,,	Aug. 28	7	7	Barnet Ord. 7 p.c.	106—109*	−3	..
300,000	1	Apl. 24	1/4½	1/7½	Bombay, Ltd.	16/--18/-	..	..
174,500	10	Aug. 14	*9	9	Bournemouth 5 p.c.	14—15*	..	..
500,050	10	,,	7	7	Do. B 7 p.c.	12—12½	..	12⅝—12½
439,160	10	,,	6	6	Do. Pref. 6 p.c.	10¾—11¼	..	10⅞—11¼
50,000	Stk.	June 26	3	3	Do. 3 p.c. Deb.	54—57	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb.	72—75	..	..
357,900	,,	Aug. 28	7½	7½	Brighton & Hove 6 p.c. Con.	112—117*	−3	..
371,880	,,	,,	6½	6½	Do. 5 p.c. Con.	99—102*	−3	..
1,287,500	,,	July 24	5	5	Bristol 5 p.c. max.	88—89a	..	..
855,000	,,	Apl. 3	7	8	British Ord.	110—115	..	113½—115
100,000	,,	June 26	7	7	Do. 7 p.c. Pref.	112—117	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	70—73	..	..
450 000	,,	,,	5	5	Do. 5 p.c. Red. Deb.	93—96	..	..
100,000	,,	June 26	5	5	Cambridge 5 p.c. Deb.	93—96	..	..
100,000	10	May 22	6	10	Cape Town, Ltd.	9—10	..	..
100,000	10	Apl. 24	4½	4½	Do. 4½ p.c. Pref.	6½—7½	..	..
150,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb.	69—74	..	..
626,860	,,	July 24	6	6	Cardiff Con. Ord.	94—97	..	..
287,860	,,	June 26	7½	7½	Do. 7½ p.c. Red. Deb.	97—100	..	..
157,150	,,	Aug. 14	6½	5	Chester 5 p.c. Ord.	86—91b	..	..
98,936	1	May 8	†2/-	†2/-	Colombo, Ltd. Ord.	33/—35/-	..	..
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref.	18/6—20/6	..	..
609,204	1	Apl. 3	1/9½	1/9½	Colonial Gas Assn. Ld. Ord	17/—19/-	..	..
296,053	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	19/—21/-	..	..
2,073,280	Stk.	July 24	7	6	Commercial Ord.	94—97	..	94½
475,000	,,	June 26	3	3	Do. 3 p.c. Deb.	56—59	..	..
787,560	,,	Aug. 14	7	7	Croydon sliding scale	104—107	..	107
453,100	,,	,,	5	5	Do. max. div.	81—84	..	..
542,270	,,	Aug. 14	10	7	Derby Con.	115—125e	..	..
55,000	,,	June 26	4	4	Do. Deb.	65—70e	..	..
209,000	,,	Aug. 28	5	5	East Hull Ord. 5 p.c.	69—71*	−2	..
1,002,180	,,	Mar. 20	†4g	†7g	European, Ltd.	105—115	+3	107—110
18,629,125	,,	July 24	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	18/10½—19/4½f	..	18/10½—19/1½
2,600,000	,,	,,	3⅛	3⅛	Do. 3½ p.c. max.	62—64	..	63—64
4,157,020	,,	,,	4	4	Do. 4 p.c. Con. Pref.	77—80	..	..
5,602,620	,,	June 26	3	3	Do. 3 p.c. Con. Deb.	59—62	+1	59½—61
3,542,770	,,	,,	5	5	Do. 5 p.c. Red. Deb.	98—101	..	100—101
161,480	,,	Feb. 20	10	10	Harrogate Cons. 10 p.c. max.	158—168	..	..
82,500	,,	Aug. 28	7	7	Hastings & St. L. 5 p.c. Conv.	97—102*	−2	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	76—81*	−2	..
70,000	10	May 22	†10	⅛	Hongkong & China, Ltd.	13½—14¼	..	..
213,200	Stk.	Aug. 14	6	6	Hornsey Con. 3½ p.c.	88—91	..	..
2,436,594	,,	May 22	10	25	Imperial Continental Cap.	345—365	..	345—358
223,180	,,	Aug. 14	3½	3½	Do. 3½ p.c. Red. Deb.	80—85	..	..
235,242	,,	Aug. 14	8½	8½	Lea Bridge 5 p.c. Ord.	123—128	..	..
2,145,907	,,	Aug. 14	6	6	Liverpool 5 p.c. Ord.	90¼—91¼b	..	..
600.000	,,	Mar. 20	7	7	Do. 7 p.c. Red. Pref.	100—102b	..	..
165,736	,,	Aug. 28	8	9	Maidstone 5 p.c. Cap.	120—125*	−3	..
63,480	,,	June 26	3	3	Do. 3 p.c. Deb.	51—54	..	..
75,000	6	June 26	†10	†10	Malta & Mediterranean	5¼—6	..	..
392,000	—	Apl. 1	5½	5½	Metrop'itan (of Melbourne) 5½ p.c. Red. Deb.	90—93	..	..
541,920	Stk.	May 22	†6	†8	Montevideo, Ltd.	105—110	..	..
2,061,315	,,	July 24	5½	5	Newcastle & Gateshead Con.	15/9—16/3d/	..	..
682,856	,,	,,	4	4	Do. 4 p.c. Pref.	70½—71½d	..	..
691,705	,,	June 26	3½	3½	Do. 3½ p.c. Deb.	66½—67½d	..	..
169,940	,,	Aug. 28	7½	7½	North Middlesex 6 p.c. Con.	106—111*	−3	..
396,160	,,	Aug. 14	5	5	Northampton 5 p.c. max.	76—81	..	..
300,000	,,	Apl. 24	9	7	Oriental, Ltd.	108—113	..	..
60,000	5	18 My., '15	—	—	Ottoman	0—¼	..	..
205,162	Stk.	June 26	8	8	Plym'th & Stonehouse 5 p.c.	105—108	..	..
424,416	,,	Aug. 28	8	8	Portsm'th Con. Stk. 4 p.c. Std	107—112*	−3	113
241,446	,,	,,	5	5	Do. 5 p.c. max.	77—80*	−1	..
186,000	100	June 2	4	4	Primitiva 4 p.c. Red. Deb.	96—99	..	..
677,837	Stk.	July 24	4	4	Do. 4 p.c. Red. Deb. 1911	81—84	+2	81½—84
371,496	,,	June 26	4	4	Do. 4 p.c. Cons. Deb.	81—84	..	..
150,000	10	Apl. 3	6	6	San Paulo 6 p.c. Pref.	8¼—9	..	..
1,736,968	Stk.	Aug. 28	6½	6½	Sheffield Cons.	100—103e*	−2½	..
95,000	,,	July 10	4	4	Do. 4 p.c. Deb.	76—78e	..	..
90 000	10	June 5	14	15	South African	4—6	..	..
6,709,895	Stk.	Aug. 14	7½	5	South Met. Ord.	101¼—103½	+½	101—103
500,000	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	107—110	..	..
1,895,445	,,	July 10	3	3	Do. 3 p.c. Deb.	58—61	+1	..
734,000	,,	Mar. 6	6½	6½	Do. 6½ p.c. Red. Db.	99—101	..	..
91,500	,,	Aug. 14	8½	8½	South Shields Con.	103—104d	..	..
1,543,795	,,	July 24	6½	6½	South Suburban Ord. 5 p.c.	100—103	..	102—103
468,837	,,	June 26	5	5	Do. 5 p.c. Deb.	93—96	..	..
647,740	,,	Aug. 28	5	5	Southampton Ord. 5 p.c. max.	74—77*	−2	..
121,275	,,	June 26	4	4	Do. 4 p.c. Deb.	71—74	..	..
179,014	,,	July 24	8	8	Sutton Ord.	110—113	..	..
67,828	,,	June 26	5	5	Do. 5 p.c. Deb.	93—96	..	..
250,000	,,	Aug. 28	7	7	Swansea 7 p.c. Red. Pref.	98—101*	..	..
200,000	,,	June 26	6½	6½	Do. 6½ p.c. Red. Deb.	98—101	..	..
1,076,490	,,	July 24	6⅝	6⅝	Tottenham District Ord.	102—106	..	103⅞
150,000	,,	,,	5⅝	5⅝	Do. 5⅝ p.c. Pref.	95—98	..	..
199,005	,,	June 26	4	4	Do. 4 p.c. Deb.	75—78	..	73¼—76¼
192,380	10	30 Dec., '12	—	—	Tuscan, Ltd.	3¾—4¾	..	..
85,701	Stk.	Mar. 20	6	6	Do. 6 p.c. Red. Deb.	76—80	..	..
309,094	,,	Aug. 28	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	94—99*	..	..
58,380	,,	,,	5	5	Do. 5 p.c. pref.	85—90*	..	..
1,180,970	,,	July 10	—	7	Wandsworth, Wimbledon, and Epsom Cons.	107—112	..	109—110¼
200,000	,,	,,	5	5	Do. 5 p.c. Pref.	87—90	..	..
488,344	,,	June 26	5	5	Do. 5 p.c. Deb.	96—99	..	98

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(This announcement is inserted gratuitously.)

PETER—WITH ONE EXCEPTION

With one exception Peter is an ordinary little fellow. Chubby, likeable, just five-and-a-half, full of life and fun and on occasions—be it admitted—of naughtiness.

Just now Peter's rather important, for this is his first term at school, and he's grappling with the intricacies of "A B C" and "Twice Two": difficult subjects to all men of five-and-a-half, but even more difficult in Peter's case because—bad luck—he's totally blind. That's his One Exception.

Peter learns reading, writing, and 'rithmetic through the medium of "Braille"—dull stuff compared with the coloured picture books of most five-and-a-halfs. However, he's a stout lad is Peter, and he's making great progress.

Would you like to know more about him? How, in spite of his "One Exception," he is being educated, and, when older, technically trained and usefully employed.

There is a long waiting list of "Peters" throughout the British Isles, for whom training and accommodation must be provided in the immediate future.

Will you help with a donation or annual subscription? Any sum, large or small, will be gratefully received.

Here's a suggestion. Your eyesight is worth 3d. a year to you. Send Peter and his handicapped pals 3d. for every year you've had it. Now, please, in case it slips your memory. Good idea!

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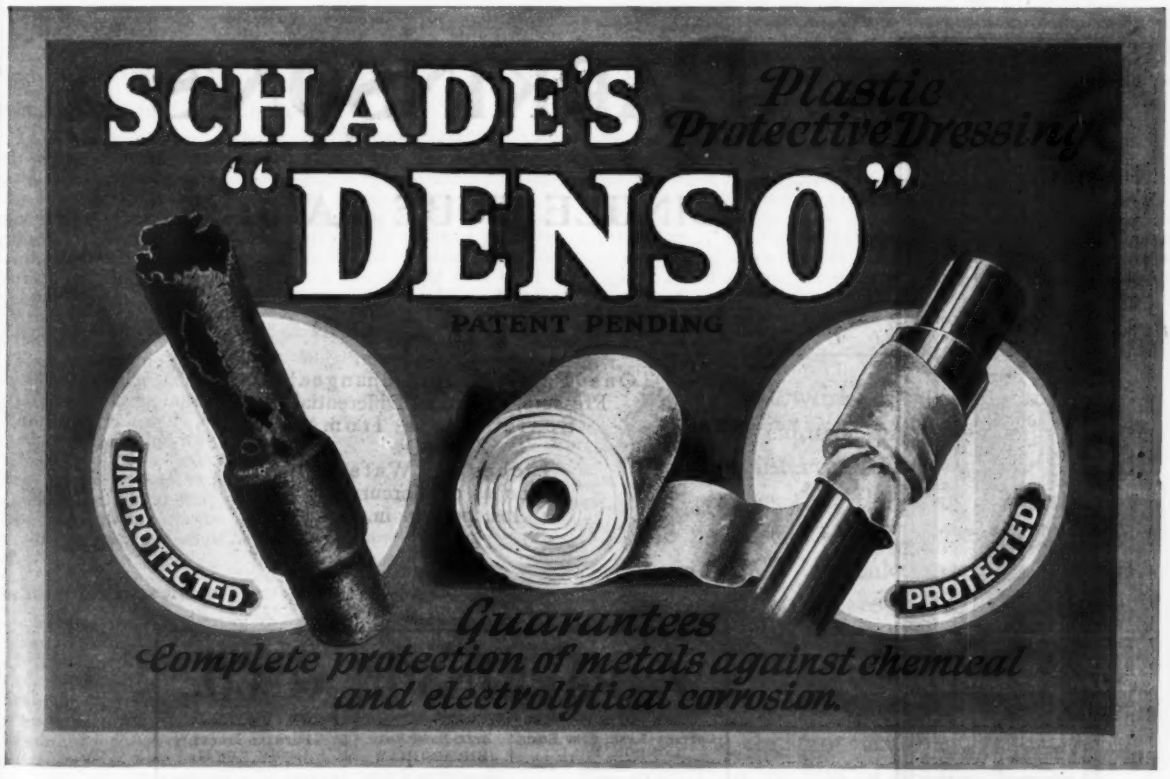

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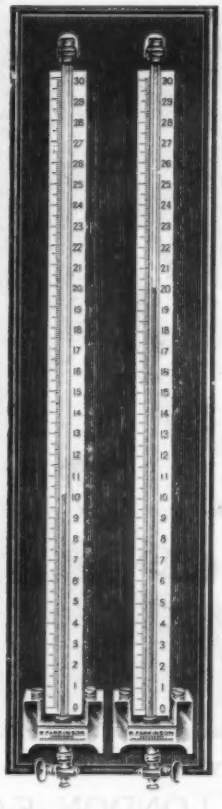

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